TEAC®

SERVICE MANUAL

V-9

Stereo Cassette Deck

Effective: February, 1981 B-00282 5704008201

1 SPECIFICATIONS AND SERVICE DATA

SPECIFICATIONS

Track System 4-track, 2-channel stereo
2 Heads Erase, record /playback
Type of Tape Cassette tape, C-60 and C-90 (Phillips type)
Tape Speed 4.8 cm/s (1-7/8 ips)
Input (Level and impedance)
MIC: Specified input level; −57 dB (1.09 mV)/10 kohms
Min. input level; −67 dB (346 μV)
LINE IN: Specified input level; −9 dB (275 mV)/50 kohms
Min. input level; −19 dB (86.9 mV)
DIN*: Min. input level; −45 dB (4.36 mV)
*Pursuant to DIN standards (Europe model only)
Output (level and load impedance)
OUTPUT: Spec. output level; −5 dB (436 mV)/50 kohms
PHONES: Spec. output level; −18 dB (97.5 mV)/8 ohms
Equalization
METAL: 3180 μs + 70 μs
Co (CrO_2): 3180 μs + 70 μs
NORMAL: 3180 μs + 120 μs
Head Configuration
1/2-track, 1-channel erase head
1/4-track, 2-channel record/playback head
3 Motors 1 DC servo motor (for capstan drive)
1 DC motor (for reel drive)
1 DC motor (for mechanism control)
Bias Frequency 100 kHz ±5 kHz
Operation Position Horizontal
Power Requirements
100/120/220/240V AC, 50/60 Hz, 30W (General Export Model)
120V AC, 60 Hz, 30W (U.S.A./Canada)
220V AC, 50 Hz, 30W (Europe)
240V AC, 50 Hz, 30W (U.K./Australia)
Weight 5.5 kg (12-2/16 lbs.) net
Dimensions See Fig. 2-2

SERVICE DATA

MECHANICAL

Tape Speed Deviation 3,000 Hz ±70 Hz
Tape Speed Drift 70 Hz
Wow and Flutter
Playback: 0.06% (WRMS)
Record/Playback: 0.25% (RMS)
Pinch Roller Pressure 400 g to 490 g (14.1 oz to 17.3 oz)
Reel Torque
Take-up: 50 to 65 g-cm (0.69 to 0.90 oz-inch)
Supply: 1.5 to 3 g-cm (0.021 to 0.042 oz-inch)
F.F.: More than 55 g-cm (0.76 oz-inch)
REW: 80 to 150 g-cm (1.1 to 2.1 oz-inch)
Fast Wind Time
85 sec. or less for MTT-501 (C-60)
Auto End-stop Time 3 sec. or less
TIMER activate Time 3 sec. or less

ELECTRICAL

Frequency Response
See Figs. 5-6 to 5-8.
Signal-to-noise Ratio
Playback NORMAL: 46 dB min.
Record/Playback
METAL, Co (CrO_2): 45 dB min.
NORMAL: 44 dB min.
S/N is improved by 5 dB at 1 kHz and 10 dB above 5 kHz when Dolby NR** is used.
Erase Efficiency 65 dB min. at 1 kHz (measured with input 10 dB higher than the specified input level).
Channel Separation 30 dB min. at 1 kHz
Adjacent Track Crosstalk 40 dB min. at 125 Hz
Total Harmonic Distortion 2.2% or less with METAL/Co(CrO_2)
2.0% or less with NORMAL

NOTES:
- Improvements may result in SPECIFICATIONS AND SERVICE DATA changes.
- Value of "dB" in the data refers to 0 dB (0.775 V), except where specified.

CAUTION
⚠ Parts marked with this sign are safety critical components. They must always be replaced with identical components – refer to the appropriate parts list and ensure exact replacement.

** Noise Reduction System manufactured under license from Dolby Laboratories Licensing Corporation.
'Dolby' and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

2 CASE AND FRONT PANEL REMOVAL

Disassemble in number-order

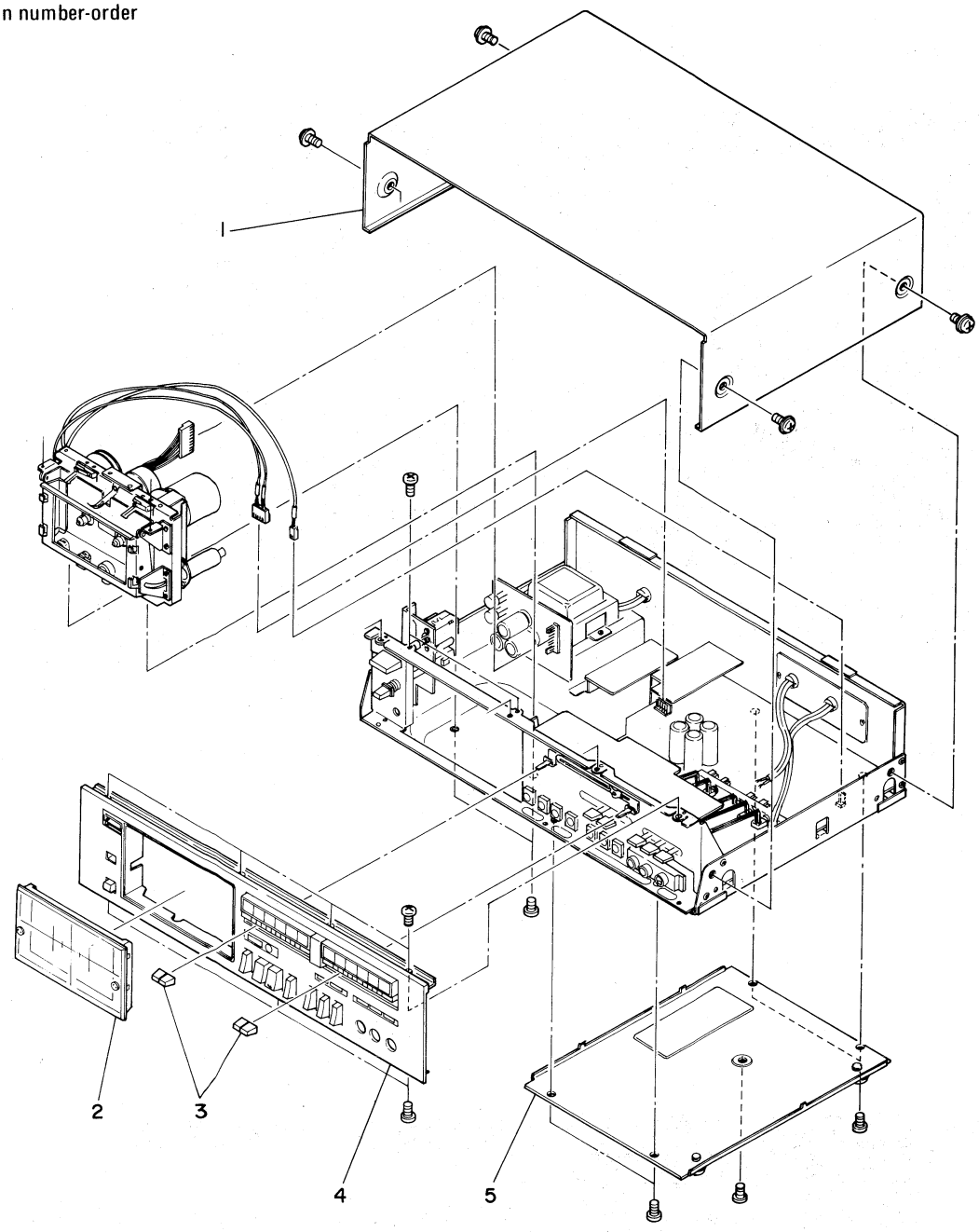


Fig. 2-1

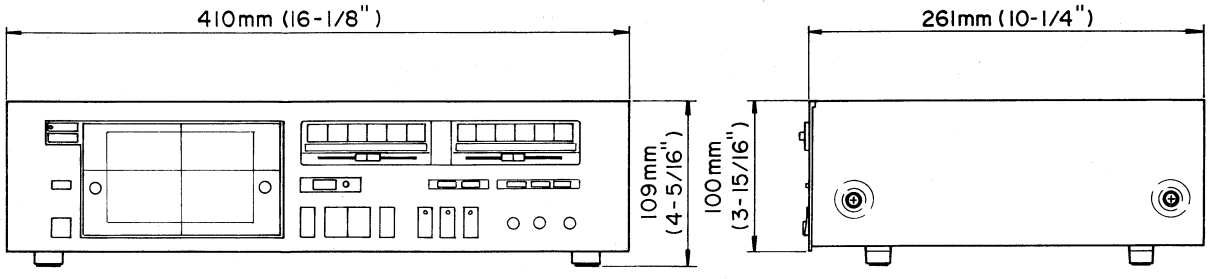


Fig. 2-2 Dimensions

3 PARTS LOCATION

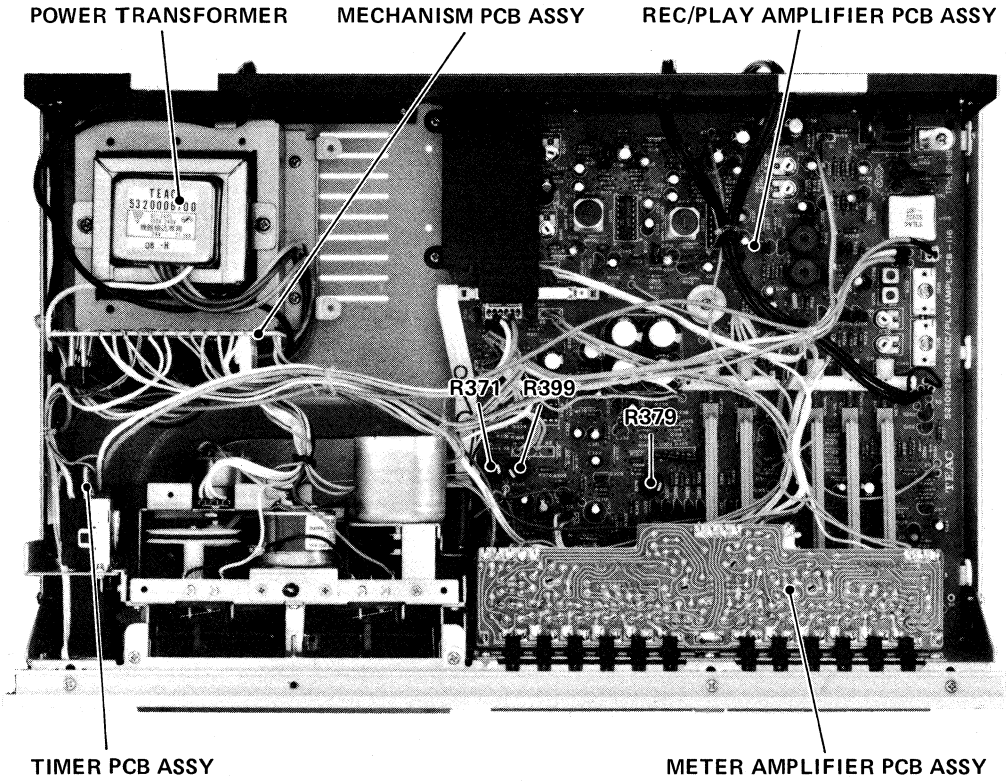


Fig. 3-1 Top view

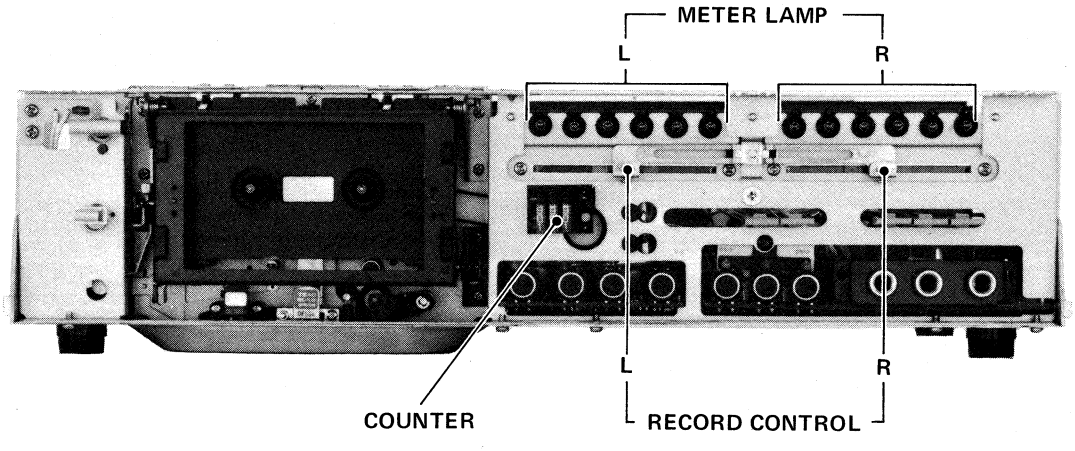
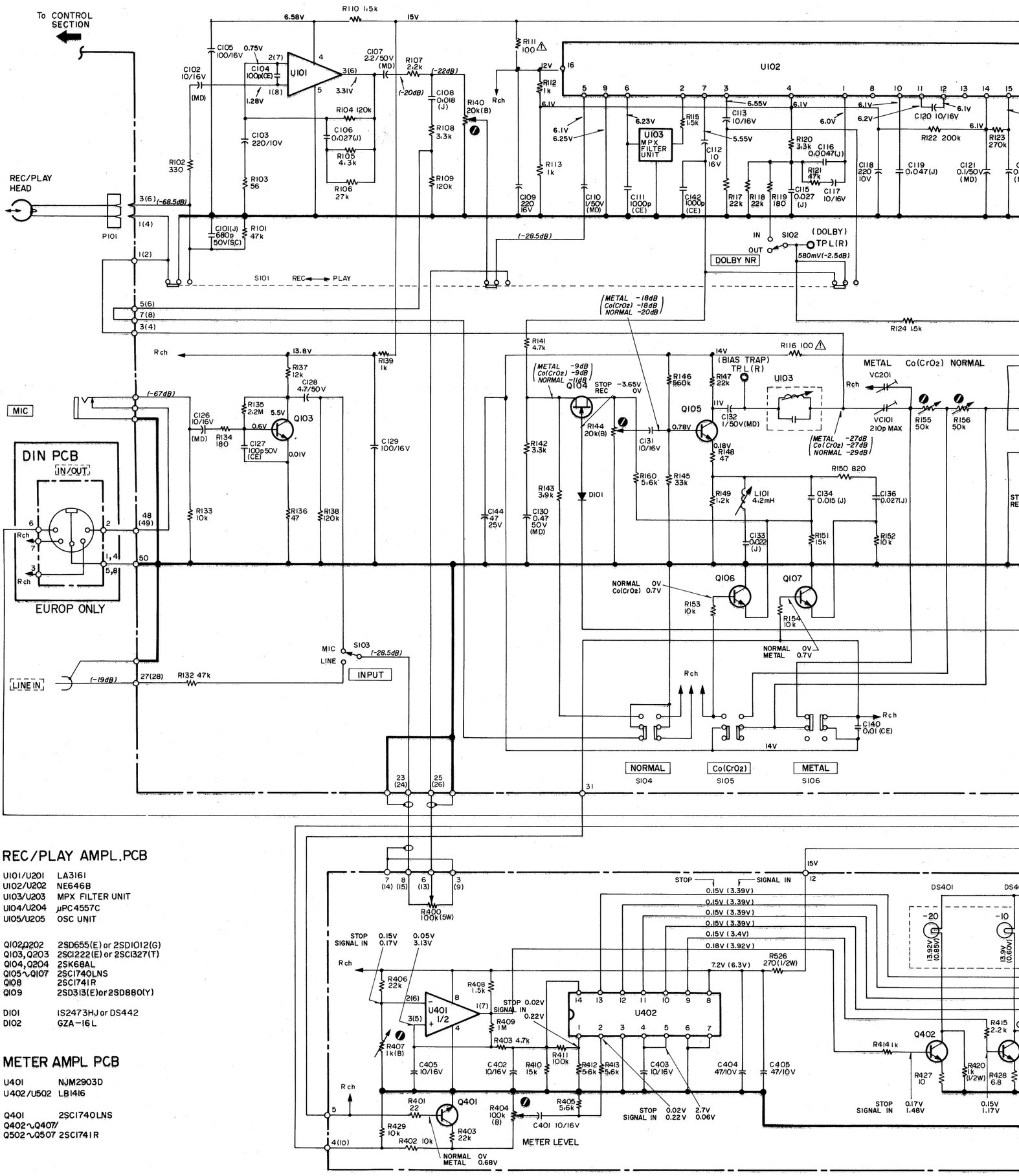


Fig. 3-2 Front view



REC/PLAY AMPL.PCB

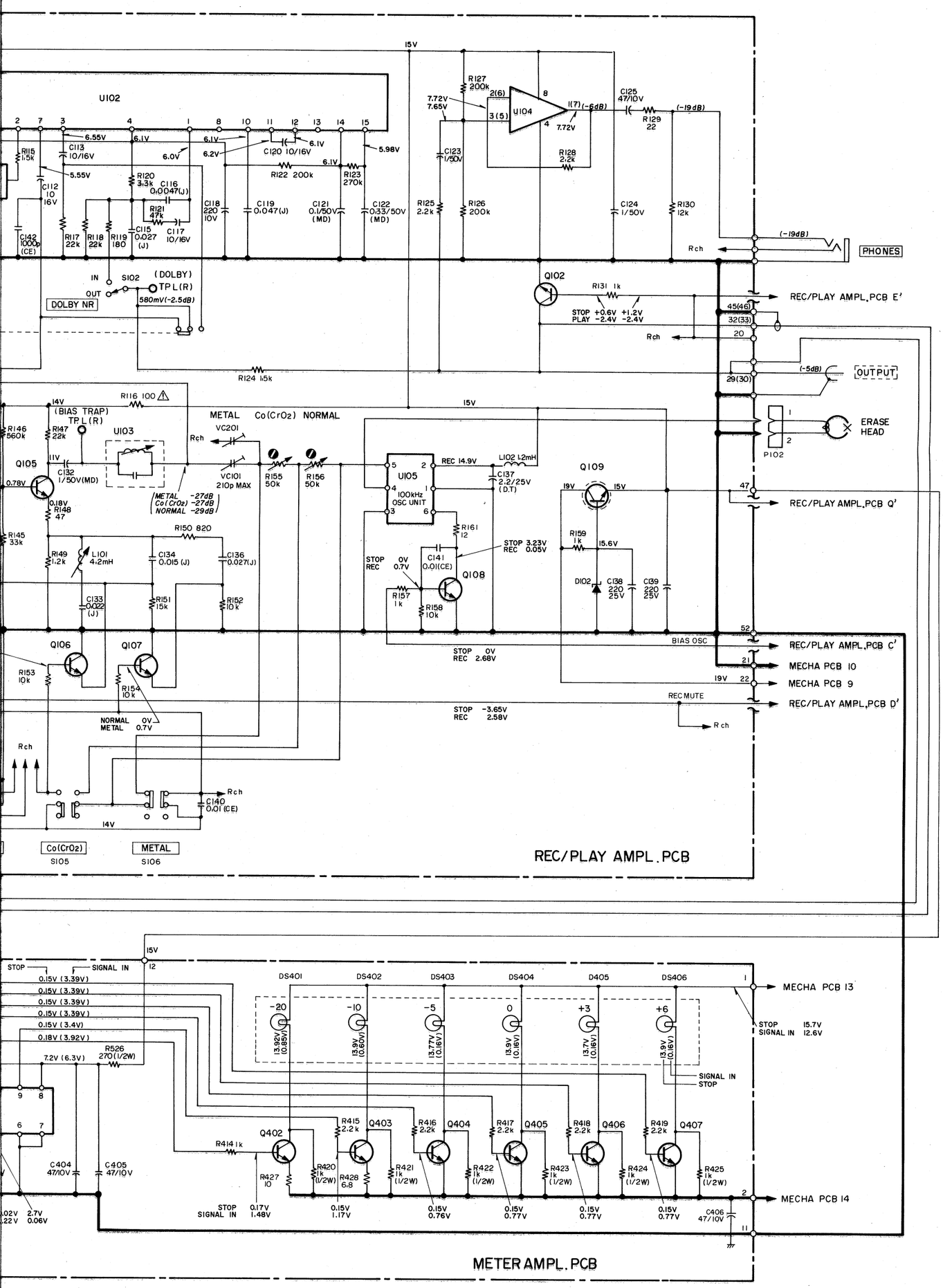
UI01/U201	LA3161
UI02/U202	NE646B
UI03/U203	MPX FILTER UNIT
UI04/U204	μPC4557C
UI05/U205	OSC UNIT
QI02,Q202	2SD655(E) or 2SDI012(G)
QI03,Q203	2SCI222(E) or 2SCI327(T)
QI04,Q204	2SK68AL
QI05∿QI07	2SCI740LNS
QI08	2SCI741R
QI09	2SD313(E)or2SD880(Y)
DI01	IS2473HJ or DS442
DI02	GZA-16L

METER AMPL PCB

U401	NJM2903D
U402/U502	LB1416
Q401	2SCI740LNS
Q402∿Q407/ Q502∿Q507	2SCI741R

NOTES

1. Schematic diagram shown for left channel unless otherwise noted. Numbers in parenthesis indicate right channel terminals.
2. All resistors are ¼ W, ±5%, unless otherwise noted. Resistor values are in ohms (k=1,000 ohms, M=1,000,000 ohms).
3. Capacitor values are in microfarads (p=picofarads).
   (MD) : Electrolytic capacitor MD series
   (CE) : Ceramic
   (SC) : Polystyrene
   (DT) : Dipped Tantalum
   All non-polarized capacitors are ±5% Mylar unless otherwise noted.



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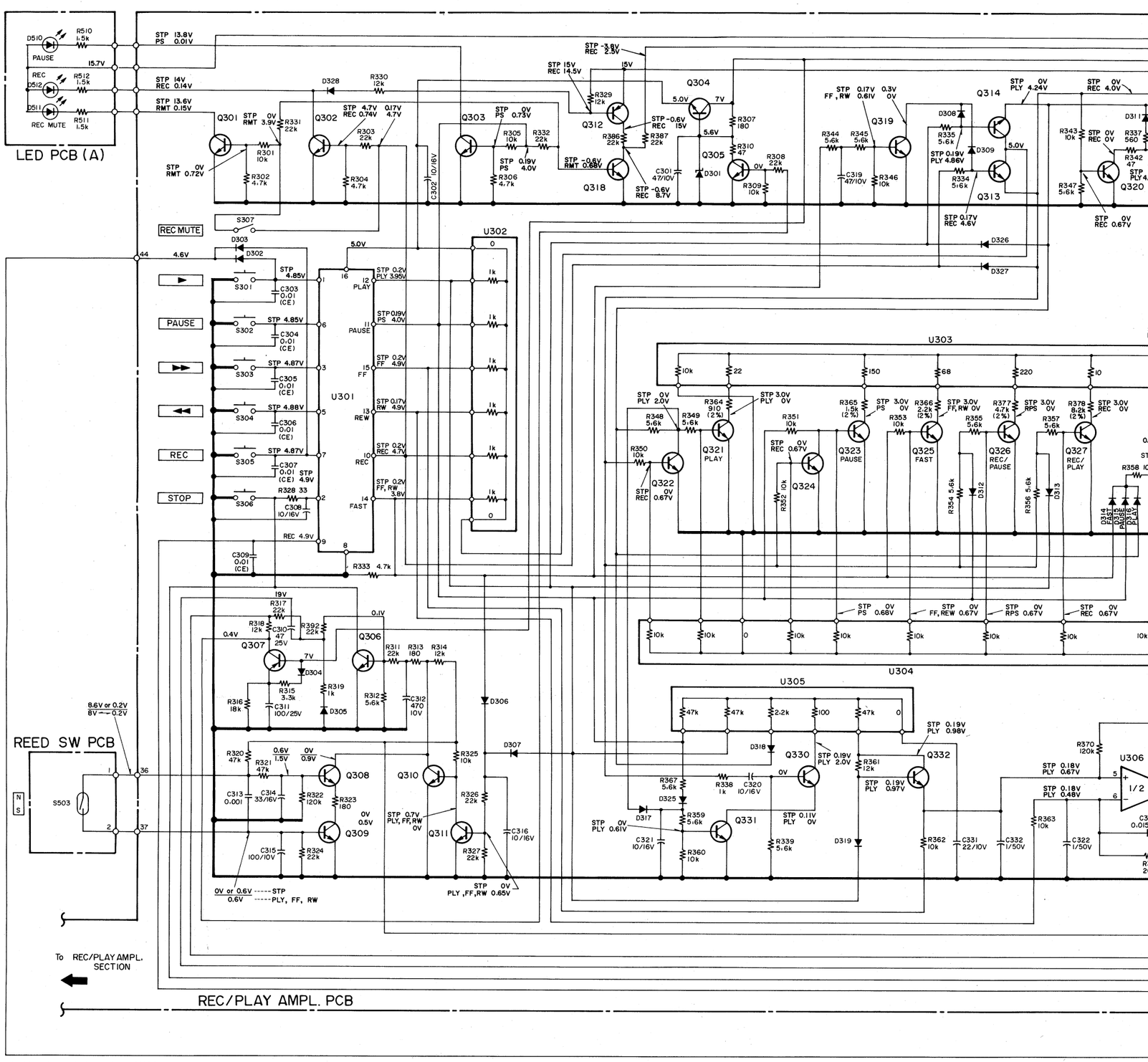
) : Electrolytic capacitor MD series
) : Ceramic
) : Polystyrene
) : Dipped Tantalum
non-polarized capacitors are ±5% Mylar unless otherwise noted.

4. ⚠ Parts marked with this sign are safety critical components. They must always be replaced with identical components - refer to the appropriate parts list and ensure exact replacement.
5. Voltage and level values are for reference only.
   0 dB=0.775V
6. ▭ : Front panel indication
7. ▭ : Rear panel indication
8. ——— : +B power supply circuit

V-9 Stereo Cassette Deck

TEAC SCHEMATIC DIAGRAM (TAPE TRANSPORT) V-9



REC/PLAY AMPL. PCB

U301	M54410P	Q301∿Q303	2SC1815 or 2SC1740 or 2SC945AK	Q313∿Q332	2SC1815 or 2SC1740 or 2SC945AK	D301	GZA5.6U	D323,D324	IR5BZ61
U302	01-0186	Q304	2SC2655(Y)	Q333	2SC2655(Y)	D302, D311	DS-442 or IS2473HJ	D325∿D329	DS-442 or IS2473
U303	01-0187	Q305,Q306	2SC1815 or 2SC1740 or 2SC945AK	Q334	2SA1020(Y)	D312,D313	OA90R or IN60		
U304	01-0188	Q307	2SA733(P)	Q335	2SC2655(Y)	D314∿D319	DS-442 or IS2473HJ		
U305	01-0189	Q308∿Q311	2SC1815 or 2SC1740 or 2SC945AK	Q336	2SA1020(Y)	D320	GZA5.6U		
U306	μPC4557C	Q312	2SA733(P)			D321,D322	GZA11U		

MECHA PCB

D401	W02
D402	KBPC102
D403	W02
D404,D405	W03C

TIMER PCB

Q501,Q502	2SC1740LNS
D501	IS2473HJ
D502	GZA6.2L

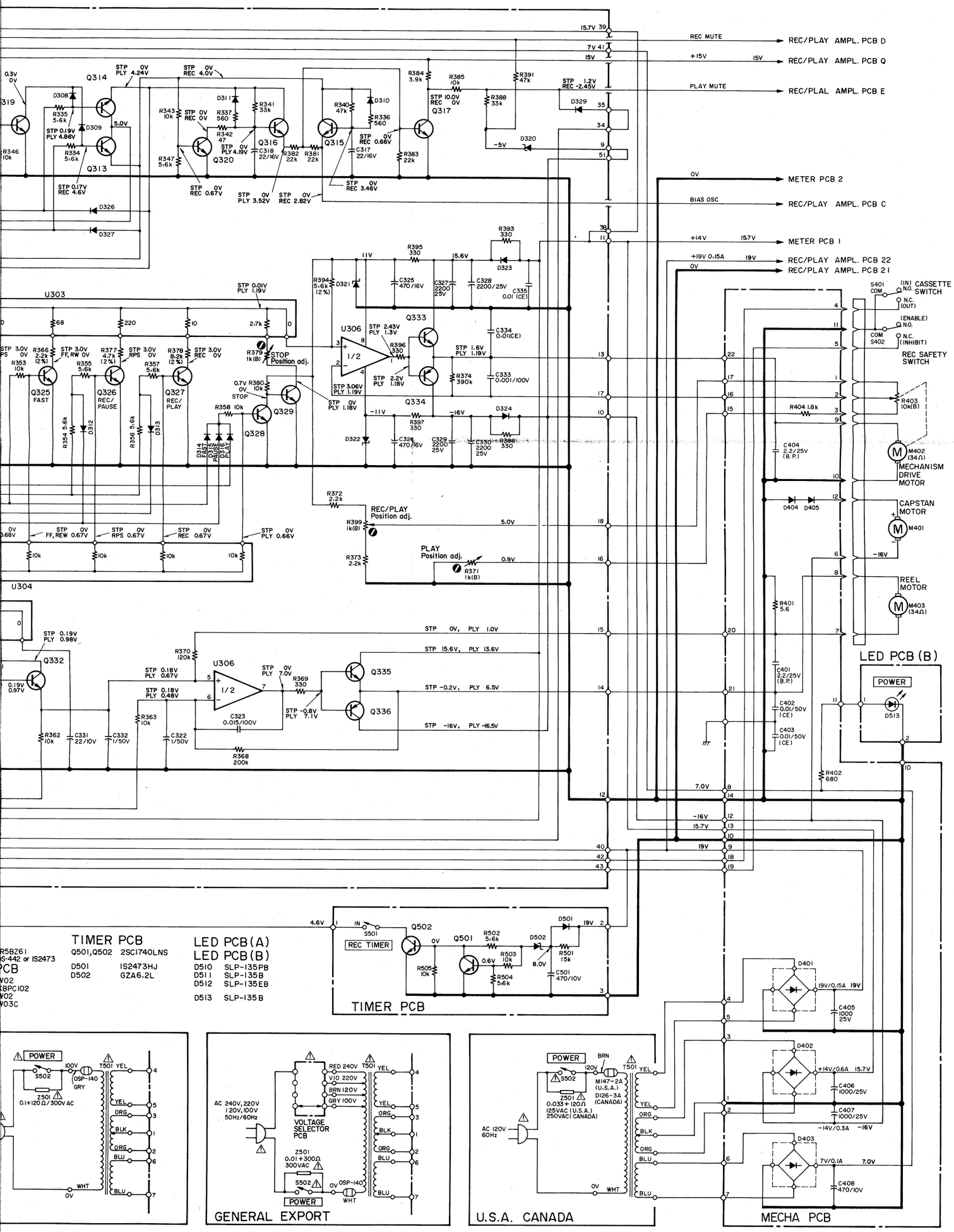
LED PC

LED PC

D510	SLP
D511	SLP
D512	SLP
D513	SLP

NOTES

1. All resistors are ¼ watt, ±5%, unless otherwise noted. Resistor values are in ohms (k=1,000 ohms).
2. All capacitor values are in microfarads.
   (CE): Ceramic
   (B.P.): Bipolar
   All non-polarized capacitors are ±5% Mylar unless o
3. Each voltage value shown above is the one measured ir unless specified as follows.
   PLY : PLAY PS : PAUSE
   REC : RECORD RPS : REC PAUSE RMT :
   FF : FAST FORWARD RW : REWIND



TIMER PCB

Q501,Q502	2SCI740LNS		
D501	IS2473HJ		
D502	GZA6.2L		

LED PCB(A)
LED PCB(B)

D510	SLP-135PB
D511	SLP-135B
D512	SLP-135EB
D513	SLP-135B

R5BZ61
S-442 or IS2473
CB
V02
BPC102
V02
V03C

esistors are ¼ watt, ±5%, unless otherwise noted.
stor values are in ohms (k=1,000 ohms).
apacitor values are in microfarads.
: Ceramic
): Bipolar
hon-polarized capacitors are ±5% Mylar unless otherwise noted.
voltage value shown above is the one measured in STOP position
ss specified as follows.
: PLAY PS : PAUSE
: RECORD RPS : REC PAUSE RMT : REC MUTE
: FAST FORWARD RW : REWIND

4. ⚠ Parts marked with this sign are safety critical components. They must always be replaced with identical components - refer to the appropriate parts list and ensure exact replacement.
5. ▭: Front panel indication
6. ———: +B power supply circuit
7. ———: −B power supply circuit

V-9 Stereo Cassette Deck

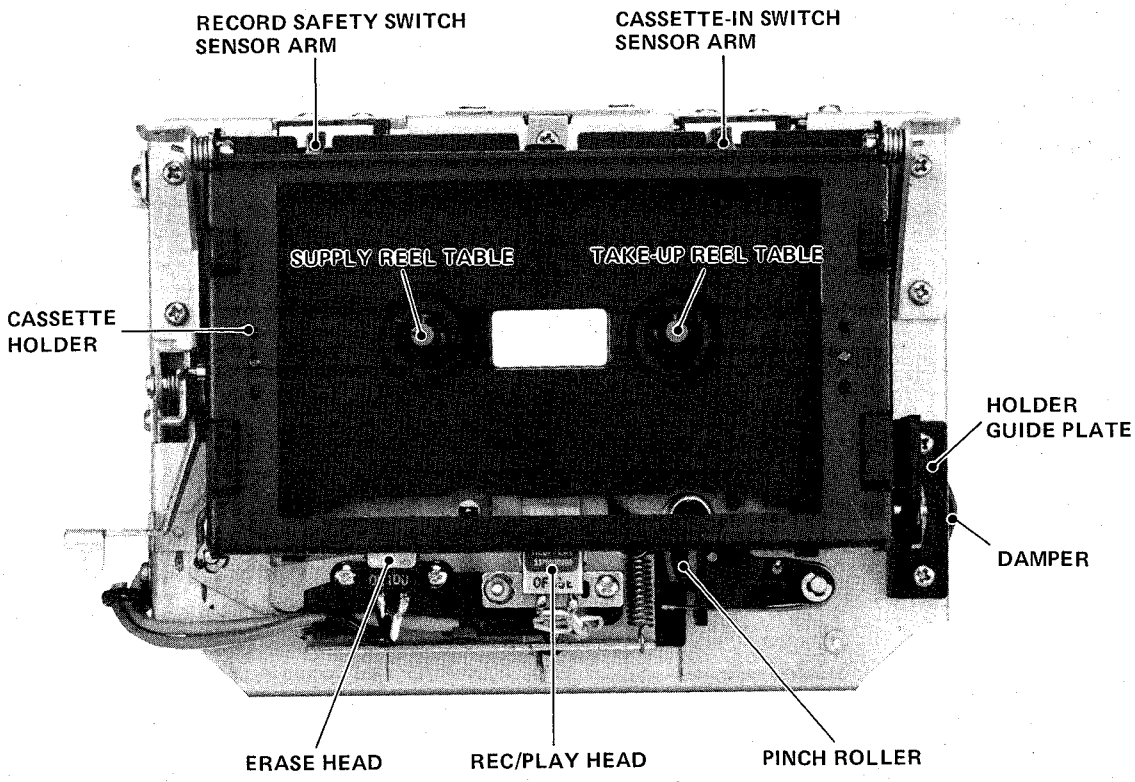


Fig. 3-3 Transport front view

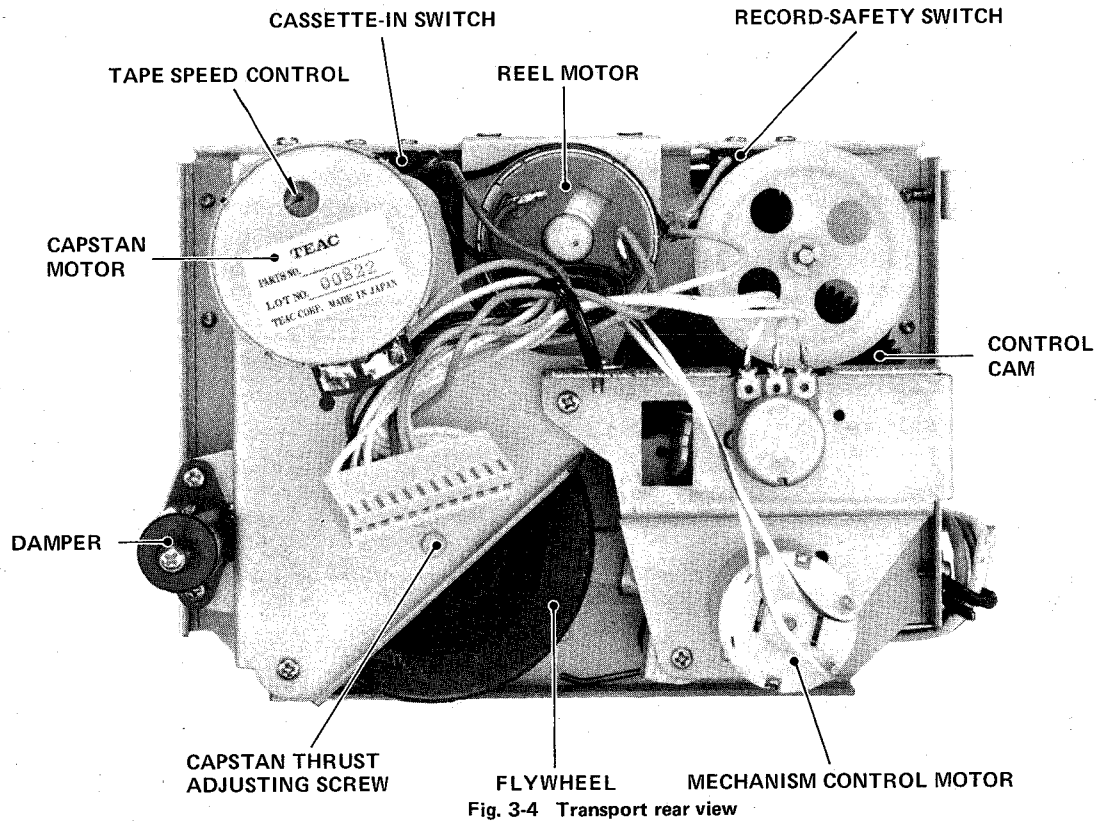


Fig. 3-4 Transport rear view

4 MECHANICAL ADJUSTMENT AND CHECKS

4-1 CAPSTAN ASSEMBLY THRUST

1. Turn the thrust adjusting screw so that thrust of the capstan shaft is from 0.1 mm to 0.2 mm. For the thrust adjusting screw location, see Fig. 3-4.

4-2 CASSETTE HOLDER

1. Adjust the holder guide plate position so that when the cassette holder in which the cassette tape is loaded is closed, the parallel condition shown in Fig. 4-1 is obtained.

Viewed from right side

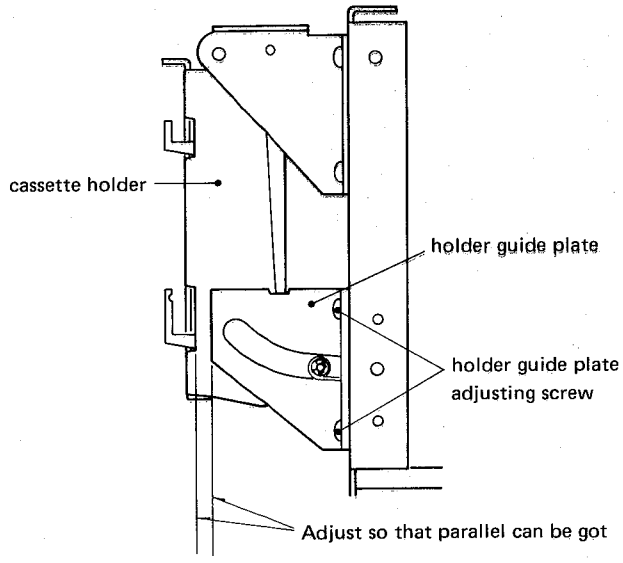


Fig. 4-1

4-3 DAMPER ADJUSTMENT

1. Load a TEAC MTT-506 tape (C-60) or equivalent and close the cassette holder.
2. Turn the air adjusting screw so that after pushing the EJECT button, the cassette holder openes completely, taking 0.5 to 1.5 seconds.

Note: Be careful not to turn the screw beyond permisssible adjustment limit shown in Fig. 4-2.

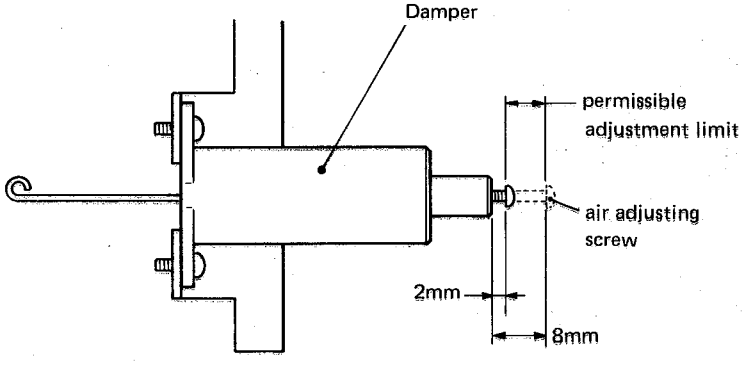


Fig. 4-2

4-4 MICRO SWITCH

1. Load any standard cassette and close the cassette holder.
2. Adjust mounting position of two micro switches, cassette-in switch (S401) and record safety switch (S402), so that the actuator position is in the setting range shown by Fig. 4-3.

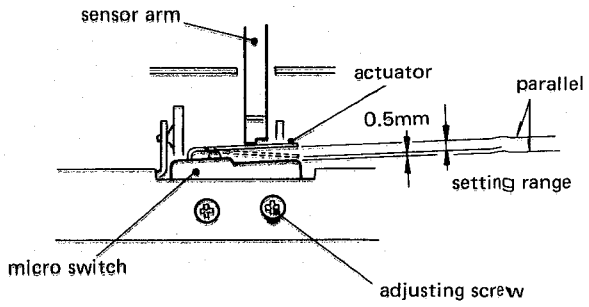


Fig. 4-3

4-5 CONTROL CAM

Note: For adjustor (R371, R379, R399) locations, see Fig. 3-1.

1. Load any cassette tape with the appropriate record-protect tab attached.
2. Push PLAY (▶) button together with REC button, then check that the center of marker ① coincides with position indicator of the reel motor mounting plate. If not, adjust by using R399.
3. After pushing STOP button, depress the PLAY button. Then check the center of marker ⑥ agrees with the indicator. R371 is provided for this adjustment.
4. Pushing the STOP button, check that the center of marker ③ coincides with the indicator as shown in Fig. 4-4. R379 is for this adjustment.
5. Check that when in REC/PAUSE mode the indicator is within range of marker ②.
6. In the same way as above, check the following.
   F, FWD and REW modes: marker ④.
   PLAY/PAUSE mode: marker ⑤.

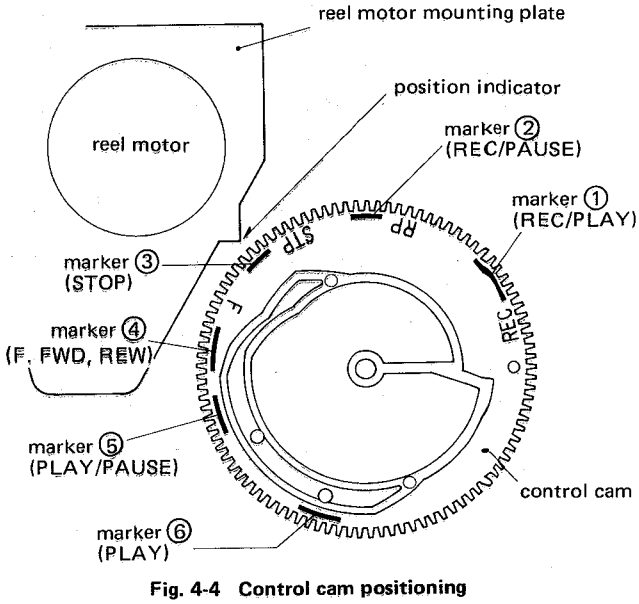


Fig. 4-4 Control cam positioning

4-6 PINCH ROLLER PRESSURE

1. With the cassette holder shut and no tape loaded, put the deck in play mode after pushing the cassette-in switch sensor arm upwards and holding it.
2. Hook a spring scale on the pinch roller assembly, as shown in the illustration.
3. Pull the scale down until there is sufficient force to separate the pinch roller from the capstan shaft.
4. Ease pressure until the pinch roller makes just enough contact with the capstan shaft so that the pinch roller just begins to turn. At this point, note the reading on the scale. It should be from 400 g to 490 g (14.1 oz. to 17.3 oz.)

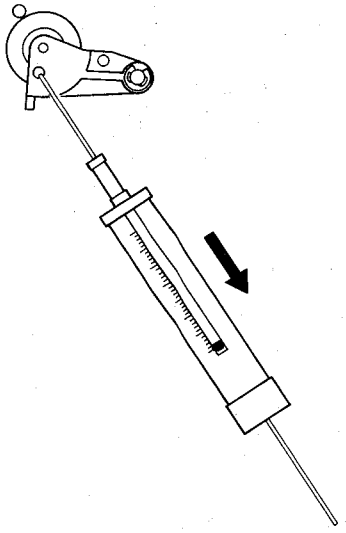


Fig. 4-5

4-7 REEL TORQUE

1. Load the cassette torque meter on the deck and read the pointer indication on the dial scale for each tape transport operation. The measured torque should be within the following values:
   Take-up: 50 to 65 g-cm (0.69 to 0.90 oz-inch)
   Supply: 1.5 to 3 g-cm (0.021 to 0.042 oz-inch)
   F.F.: More than 55 g-cm (0.76 oz-inch)
   REW: 80 to 150 g-cm (1.1 to 2.1 oz-inch)
2. Take-up torque may be adjusted if required. Within the take-up reel table you will notice three small "teeth" located at 120° around the hub and one marker "tooth" on the periphery. Torque is adjusted by pushing and slightly lifting the "tooth" Ⓐ on the ramp* near the marker up or down. The ramps are like a three step stairway. Maximum torque is when the teeth sit on the highest steps.
   * This ramp has catches on each step.

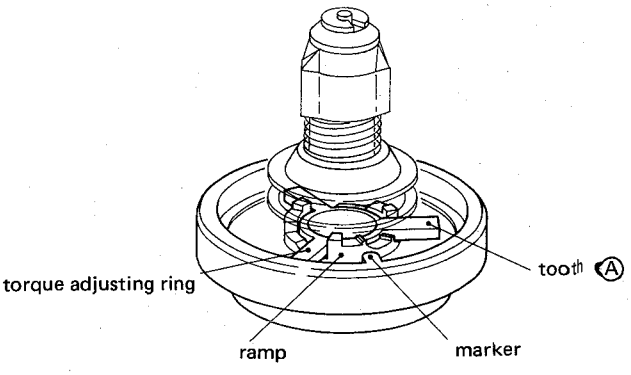


Fig. 4-6 Take-up reel table

4-8 TAPE SPEED

1. Connect a frequency counter to the deck as shown in Fig. 4-7.
2. Play a tape for more than five minutes to warm up the deck, then load a TEAC MTT-111 test tape contining a 3000-Hz test tone and play the test tape from the beginning.
3. While the tape is playing, use a common slotted screwdriver with the handle completely insulated from the blade, and adjust the control on the capstan motor (see Fig. 3-4) for a reading of 3015 to 3025 Hz on the frequency counter.
4. Play the tape at the beginning and at the end, and check that the speed deviation is within the prescribed limits by observing that the reading on the frequency counter never deviates more than ±70 Hz from 3000 Hz, nor drifts more than 70 Hz at any given time.

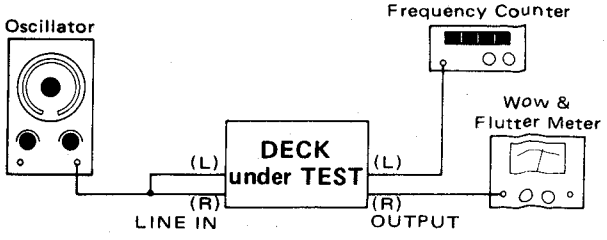


Fig. 4-7

4-9 WOW AND FLUTTER

Note: These measurements should be made at the beginning, middle, and the end of the tape.

1) PLAYBACK

1. Connect a wow-and-flutter meter to the deck as shown in Fig. 4-7.
2. Load and play a TEAC MTT-111 test tape.
3. Check that the reading on the wow-and-flutter meter is within 0.06% (WRMS).

2) RECORD/PLAYBACK

4. Load a TEAC MTT-501 test tape (blank) and record a 3000-Hz signal.
5. Rewind the tape to the beginning of the recorded section, and play it.
6. The wow and flutter should not be more than 0.25% (RMS).

4-10 LUBRICATION

Lubrication is only required when parts are replaced. For this purpose, use the oil and grease specified below.

Oil: TEAC spindle oil (from TEAC TZ-255 oil kit), Mobil D.T.E. Oil Light, or equivalent

Grease: ORE-LUBE G1/3 or equivalent

1. Apply a drop of oil with an oil applicator to a point about 1/3 the way down the shaft (from the free end) of the flywheel, then insert the shaft into the capstan housing.
2. Apply a suitable amount of light grease to the well of the flywheel bearing.

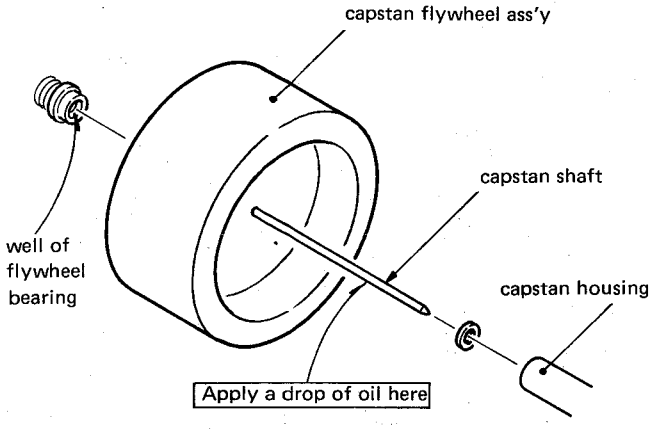


Fig. 4-8

4-11 VOLTAGE SELECTION (FOR GENERAL EXPORT MODELS)

1. Always disconnect the power line cord before making these adjustments.
2. Remove the top cover of the deck by removing the screws from the sides.
3. Locate the voltage selector, shown in the illustration (near the power transformer).
4. Loosen the two screws in the jumper bar and move the bar so that it jumpers the opposing terminals marked with the required voltage (100, 120, 220 or 240).
5. Regithten the screws and replace the top cover.

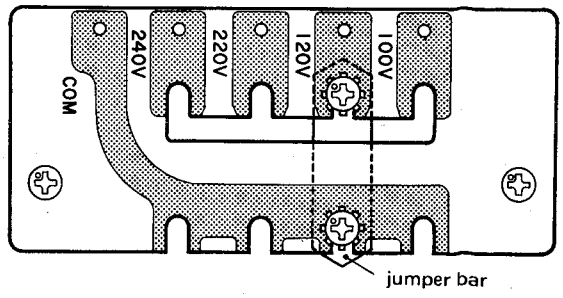


Fig. 4-9

5 ELECTRICAL ADJUSTMENT AND CHECKS

PRECAUTIONS

1. Before performing adjustments and checks, clean and demagnetize the entire tape path.
2. Make sure the deck is properly set for the voltage in your locality.
3. In general, adjustments and checks are made in the order of L-ch then R-ch. Double REF. Nos. and test point designations indicate L-ch/R-ch. (Example: R404/R504)
4. 0 dB is referenced to 0.775 V. If an AC voltmeter that references 0 dB to 1 V is used, appropriate compasation should be made.
5. The AC voltmeter used in the procedures must have an input impedance of 1M-ohms or more.
6. Note the "Deck settings" at the top of each chart. The settings apply to all checks for a specific chart unless explicitly stated otherwise.

–70 dB or more ... What does it mean?

In reference to some specifications, you may come across an expression like: "–70 dB or more". This means that the lower the value of this specification, the greater the absolute value of the specification and the better the performance of the deck. For instance, a noise floor of –76 dB is better than –70 dB, because this means that the level of noise is lower. So in this case, "–70 dB or more" means at least as good a value as –70 dB and maybe even better, i.e., –71 dB.

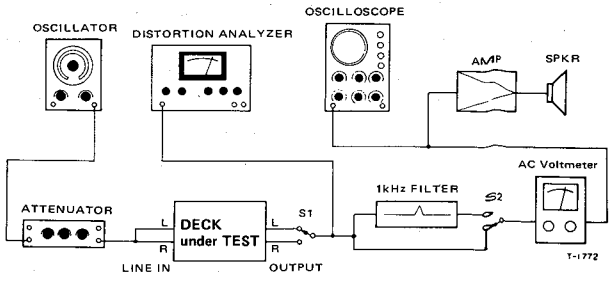


Fig. 5-1 Basic test setup

5-1 PLAYBACK PERFORMANCE

Deck settings:
DOLBY NR sw: OUT
TAPE (BIAS/EQ) sw: METAL

TEAC test tapes:
MTT-150: For Dolby level calibration
MTT-316: For playback frequency response check for METAL, Co(CrO_2)
MTT-501: For S/N check with NORMAL

ITEM	SETTING	INPUT SIGNAL	ADJUST (or CHECK)	MEASURING POINT: RESULT	REMARKS
1. REC/PLAY head azimuth	Connection: Fig. 5-2 OUTPUT cont.: convenient output level position	MTT-150	Check	OUTPUT: Phase: within 45°	Refer to Fig. 5-4
		MTT-316 (10 kHz)	Azimuth nut of R/P heads (Fig. 5-3)	OUTPUT: Max. output at L- & R-ch's (on VTVM)	
2. Specified output level	—	MTT-150	R140/R240	TP. L/TP. R (DOLBY) 580 mV (–2.5 dB)	
	—	MTT-150	Check	OUTPUT: –5 dB ±1 dB (388 to 489 mV)	Spec. output level
3. Peak level meter	TAPE sw: Co(CrO_2)	MTT-150	R404/R504	Peak level meter: "0 dB" light: to go ON	
	TAPE sw: METAL	MTT-150	Check	Peak level meter: "0 dB" light: to go OFF	
4. Frequency response	TAPE sw: METAL If 10 kHz output is lower than spec., cut R106 and/or R206 on R/P PCB.	MTT-316	Check	OUTPUT: Fig. 5-6	
	TAPE sw: NORMAL	MTT-316	Check	OUTPUT: At 10 kHz should be approx. 4 dB higher than measured in above step.	
5. Signal-to-noise ratio	TAPE sw: NORMAL	Fully-erased tape: (Use bulk tape eraser)	Check	OUTPUT: 46 dB min.	Ratio of spec. output of –5 dB to noise

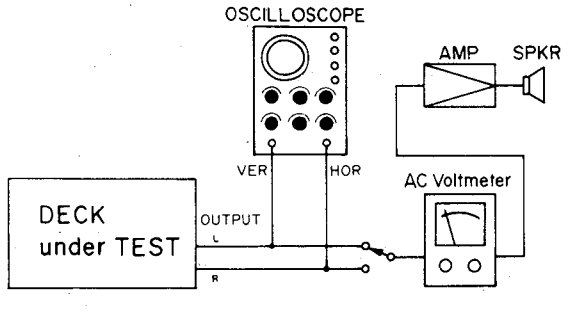


Fig. 5-2 Test setup for azimuth check

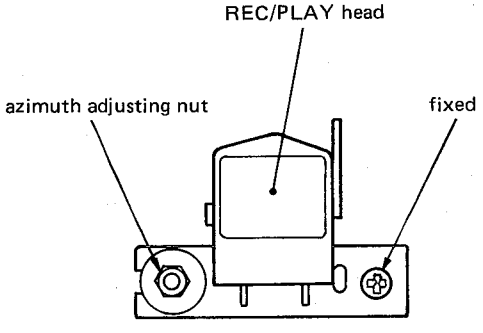


Fig. 5-3 Azimuth nut location

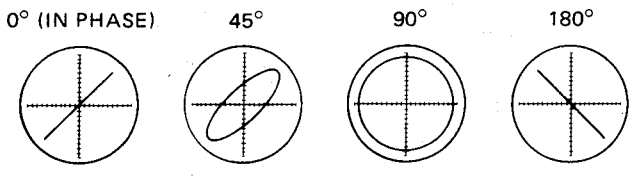


Fig. 5-4 Confirming phase relationship

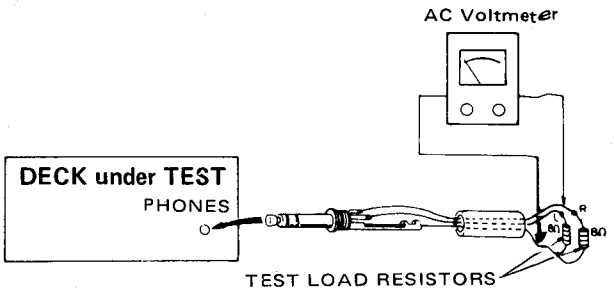


Fig. 5-5 Test setup for headphone check

5-2 MONITOR PERFORMANCE

Deck setting:
REC-PAUSE mode
DOLBY NR sw.: OUT
INPUT sw.: LINE

ITEM	SETTING		INPUT SIGNAL	ADJUST (or CHECK)	MEASURING POINT: RESULT	REMARKS
6. Min. input level	RECORD cont.: Max.	INPUT sw: MIC	MIC: 400 Hz/–67 dB (346 μV)	Check	OUTPUT: –5 dB ±3 dB (308 to 615 mV)	MIC min. input level
		INPUT sw: MIC	DIN IN: 400 Hz/–45 dB (4.36 mV)	Check	OUTPUT: –5 dB ±3 dB (308 to 615 mV)	DIN min. input level (For European models)
		INPUT sw: LINE	LINE IN: 400 Hz/–19 dB (86.9 mV)	Check	OUTPUT: –5 dB ±3 dB (308 to 615 mV)	LINE min. input level
7. Specified LINE input level	—		LINE IN: 400 Hz/–9 dB (275 mV)	RECORD cont. (L/R)	TP. L/TP. R (DOLBY) 580 mV (–2.5 dB)	Specified setting of RECORD cont.
	—		LINE IN: 400 Hz/–9 dB (275 mV)	Check	OUTPUT: –5 dB ±1 dB (388 to 489 mV)	
	IMPORTANT: Do not change the setting of the Record controls after establishing their setting as above.					
8. Headphone output level	Connection: Fig. 5-5		LINE IN: 400 Hz/–9 dB (275 mV)	Check	PHONES: –18 dB ±3 dB (69.0 to 138 mV)	8 ohm load
9. Peak level meter	TAPE sw: Co (CrO_2) or NORMAL		LINE IN: 400 Hz/–9 dB (275 mV)	Check	Peak level meter: "0 dB" light: to go ON	
			LINE IN: 400 Hz/–29 dB (27.5 mV)	R407/R507	Peak level meter: "–20 dB" light: to go ON	
				Check	Peak level meter: When TAPE switch is changed to METAL, "–20" light is to go OFF.	
			LINE IN 400 Hz	Check	Level at which peak level meter's light goes ON when input level is raised.	

P. I. meter's light	Input level
–20 dB	–29 dB ±3 dB (19.5 to 38.8 mV)
–10 dB	–19 dB ±2 dB (69.0 to 109 mV)
–5 dB	–14 dB ±1.5 dB (130 to 184 mV)
0 dB	–9 dB ±1.5 dB (231 to 327 mV)
+3 dB	–6 dB ±1.5 dB (327 to 461 mV)
OVER	–3 dB ±1.5 dB (461 to 652 mV)

5-3 RECORDING PERFORMANCE

DECK settings:
DOLBY NR sw.: OUT
INPUT sw.: LINE
Record Controls (L/R): Specified position (item 7)

TEAC test tapes:
MTT-5061: For record test with Co (CrO_2)
MTT-501: For record test with NORMAL
MTT-5072: For record test with METAL

ITEM	SETTING	INPUT SIGNAL	ADJUST (or CHECK)	MEASURING POINT: RESULT	REMARKS
10. BIAS trap	Record-pause mode	LINE IN: No signal	U106/U206	TP. L/TP. R (BIAS TRAP TP) Min. reading	
11. Record bias	1) Turn trim pots R155 and R156 fully clockwise for each trim pot to have minimum value. Then adjust in the order of steps (2) (3) (4).				
	2) TAPE sw.: METAL Tape: MTT-5072	LINE IN: 400Hz & 6.3 kHz alternately/–42 dB (6.15 mV)	C145/C245	OUTPUT: Nearly equal level at both frequencies	
	3) TAPE sw.: Co (CrO_2) Tape: MTT-5061	LINE IN: 400 Hz & 6.3 kHz alternately/–42 dB (6.15 mV)	R155.....	OUTPUT: Nearly equal level at both frequencies	... For L- & R-ch's
	4) TAPE sw.: NORMAL Tape: MTT-501	LINE IN: 400 Hz & 6.3 kHz alternately/–42 dB (6.15 mV)	R156.....	OUTPUT: Nearly equal level at both frequencies	... For L- & R-ch's
12. Record level	TAPE sw.: METAL Tape: MTT-5072	LINE IN: 400 Hz/–12 dB (195 mV)	R144/R244	OUTPUT: –8 dB (308 mV)	
	TAPE sw.: Co(CrO_2) Tape: MTT-5061	LINE IN: 400 Hz/–12 dB (195 mV)	Check	OUTPUT: –8 dB ±1.5 dB (259 to 367 mV)	
	TAPE sw.: NORMAL Tape: MTT-501	LINE IN: 400 Hz/–12 dB (195 mV)	Check	OUTPUT: –8 dB ±1.5 dB (259 to 367 mV)	
13. Frequency response	TAPE sw.: METAL Tape MTT-5072	LINE IN: Required signal/ –42 dB (6.15 mV)	L101/L201	OUTPUT: Fig. 5-7	
	TAPE sw.: Co(CrO_2) Tape: MTT-5061	LINE IN: Required signal/ –42 dB (6.15 mV)		OUTPUT: Fig. 5-7	
	TAPE sw.: NORMAL Tape: MTT-501	LINE IN: Required signal/ –42 dB (6.15 mV)		OUTPUT: Fig. 5-8	
	If frequency response is out of specification, recheck #11. "Record bias".				
14. Total harmonic distortion	Same as 12 above.	LINE IN: 400 Hz/–12 dB (195 mV)	Check	OUTPUT: 2.2% or less with METAL, Co(CrO_2) 2.0% or less with NORMAL	
15. Signal-to-noise ratio	TAPE sw.: METAL Tape: MTT-5072	LINE IN: 1 kHz/–9 dB (275 mV) ↓ no signal	Check	OUTPUT: 45 dB min.	Ratio of specified output of –5 dB to noise
	TAPE sw.: Co(CrO_2) Tape: MTT5061	LINE IN: 1 kHz/–9 dB (275 mV) ↓ no signal	Check	OUTPUT: 45 dB min.	
	TAPE sw.: NORMAL Tape: MTT-501	LINE IN: 1 kHz/–9 dB (275 mV) ↓ no signal	Check	OUTPUT: 44 dB min.	

ITEM	SETTING	INPUT SIGNAL	ADJUST (or CHECK)	MEASURING POINT: RESULT	REMARKS
16. Erase efficiency	• Connection is same as in Fig. 5-1, but engage 1-kHz filter. • Record a 1-kHz signal. Rewind tape to midpoint of recorded portion. Record a "no signal" portion. Find the difference between the 1-kHz portion and the "no-signal" portion.				
	TAPE sw.: METAL Tape: MTT-5072	LINE IN: 1 kHz/+1 dB (0.869 V) ↓ no signal	Check	OUTPUT: 65 dB min. ratio	Ref. output level : +5 dB (1.38 V)
17. REC MUTE function	• Connection: Fig. 5-1, but engage 1-kHz filter. • Record a 1-kHz signal. Push REC MUTE button for several seconds. (At this time, make sure LED on the button lights). Rewind and play the tape. Find the difference between the 1-kHz portion and the "no-signal" portion.				
	TAPE sw.: Co(CrO_2) Tape: MTT-5061	LINE IN: 1 kHz/+1 dB (0.869 V) ↓ no signal	Check	OUTPUT: 65 dB min. ratio	Ref. output level: +5 dB (1.38 V)
18. Channel separation	• Connection Fig. 5-1, but do not connect LINE IN (R), and engage 1-kHz filter. • Set the deck to record mode. Find the difference between the 1-kHz recorded portion (L-ch) and the "no signal" portion (R-ch).				
	TAPE sw.: Co(CrO_2) Tape: MTT-5061	LINE IN: L-ch 1 kHz/–9 dB (275 mV) R-ch No signal	Check	OUTPUT: 30 dB min. ratio	
19. Adjacent track crosstalk	• Connection: Fig. 5-1, but do not connect LINE IN (L) and OUTPUT (L). • Record a 125-Hz signal on R-ch and note output level. Invert tape and play R-ch track. Check leakage level against the output reference of previously recorded portion.				
	TAPE sw.: Co(CrO_2) Tape: MTT-5061	LINE IN: L-ch No signal R-ch 125 Hz/–9 dB (275 mV)	Check	OUTPUT: 40 dB min. ratio	
20. Dolby NR effect	• Record a 1-kHz signal with DOLBY NR switch OUT. Play this portion with DOLBY NR switch set to OUT and set to IN. Obtain the difference in output level between OUT and IN positions. Repeat the above process using a 10-kHz signal.				
	TAPE sw.: Co(CrO_2) Tape: MTT-5061	LINE IN: 1 kHz/–32 dB 19.5 mV)	Check	OUTPUT: Variation 3 dB ~ 8 dB	
	TAPE sw.: Co(CrO_2) Tape: MTT-5061	LINE IN: 10 kHz/–42 dB (6.15 mV)	Check	OUTPUT: Variation 8 dB ~ 12 dB	

5-4 FREQUENCY RESPONSE

BIAS/EQ	METAL	Co (CrO_2)
TAPE	MTT-316	MTT-316

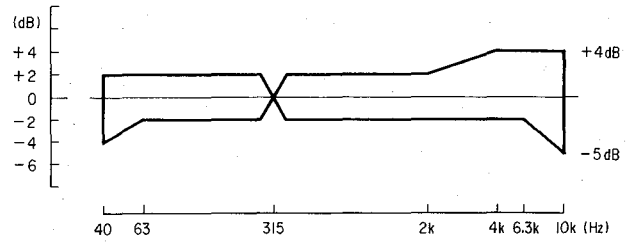


Fig. 5-6 Playback frequency response

BIAS/EQ	METAL	Co(CrO_2)
TAPE	MTT-5072	MTT-5061

---- DOLBY NR: IN

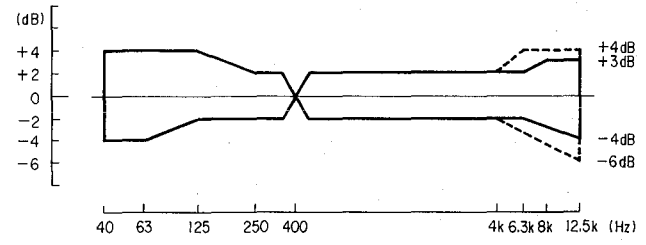


Fig. 5-7 Overall fraquency response [METAL, Co (CrO_2)]

BIAS/EQ	NORMAL
TAPE	MTT-501

---- DOLBY NR:IN

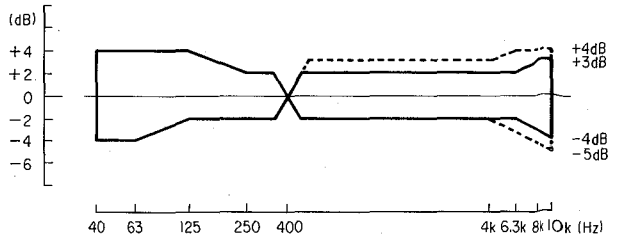


Fig. 5-8 Overall frequency response [NORMAL]

5-5 ADJUSTMENT AND TEST POINT LOCATIONS

REC/PLAY AMPL. PCB

R140/R240	Playback level
R144/R244	Record level
R155	Record bias – Co(CrO_2)
R156	Record bias – NORMAL
C145/C245	Record bias – METAL
L101/L201	Record frequency response
U106/U206	Bias trap

METER AMPL. PCB

R404/R504	Peak level meter – playback
R407/R507	Peak level meter – monitor

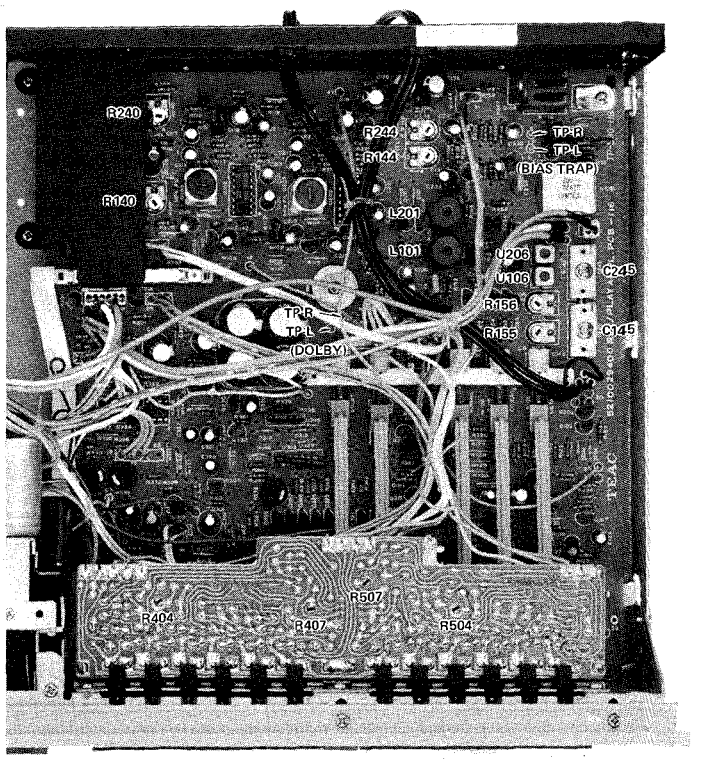
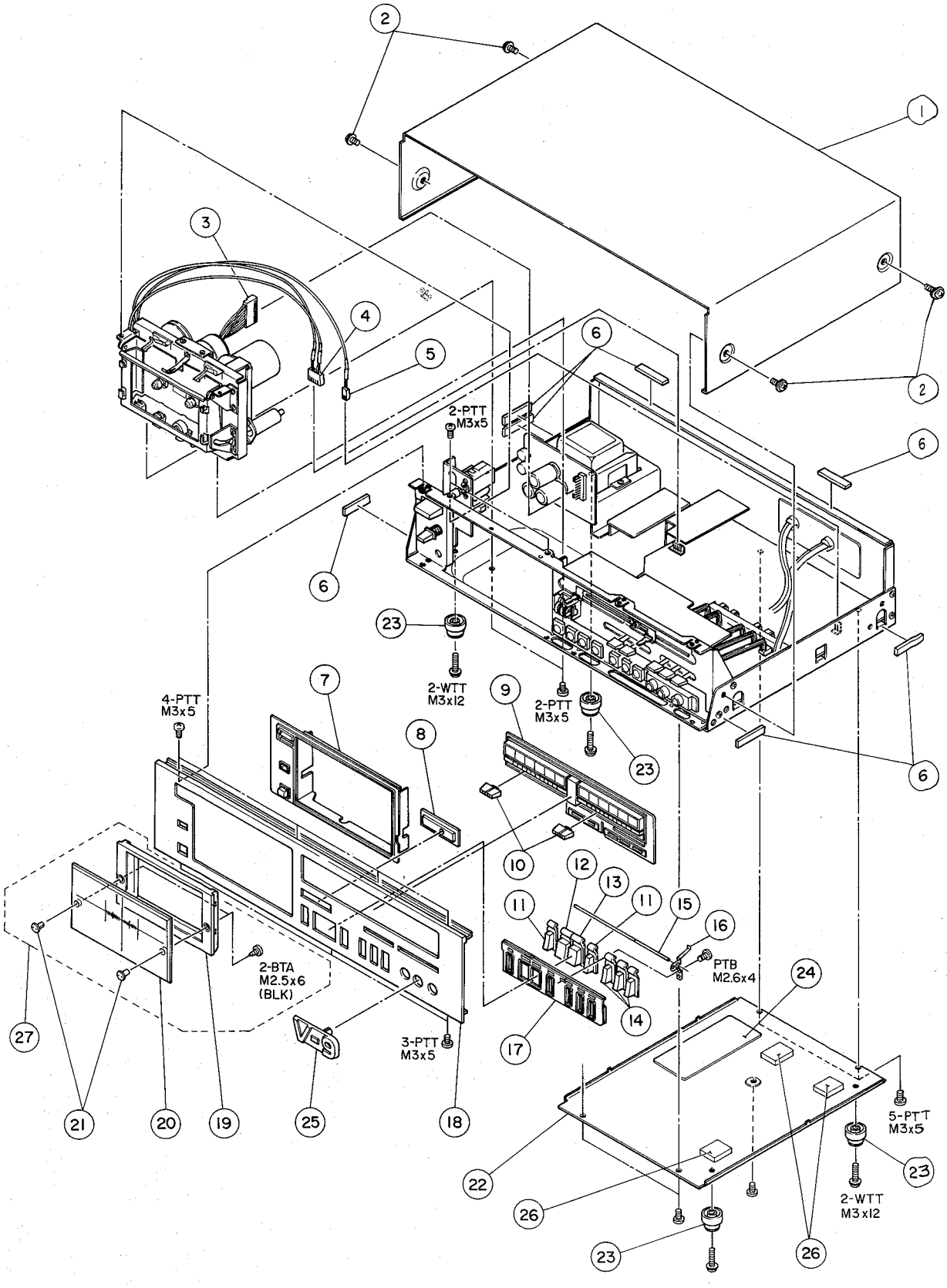


Fig. 5-9

6 EXPLODED VIEWS AND PARTS LIST

EXPLODED VIEW - 1



Parts marked with *require longer delivery time.

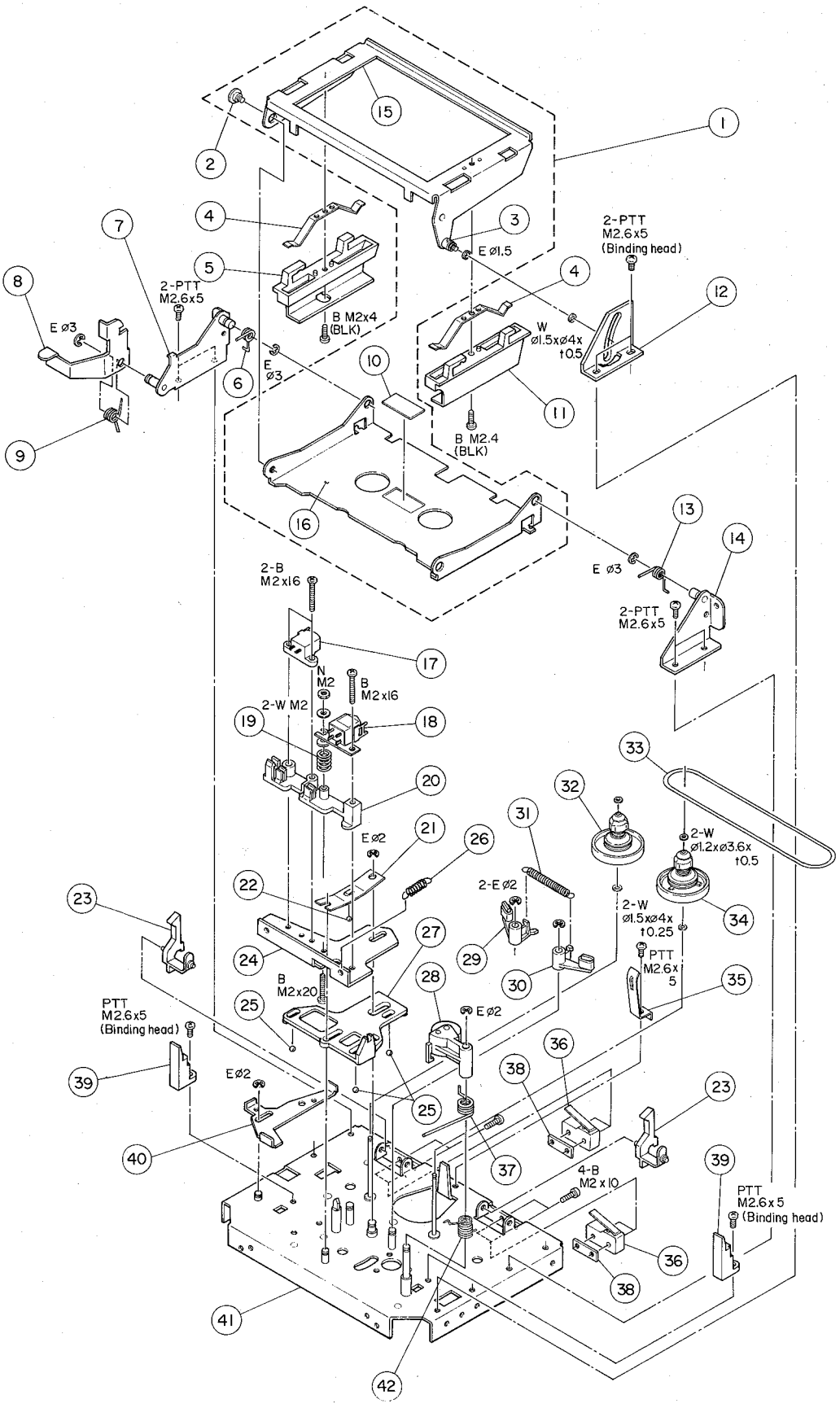
REF. NO.	PARTS NO.	DESCRIPTION	REMARKS
1 - 1	*5800119500	Cover, Top	
1 - 2	*5783114006	Screw, M4 x 6 (BLK Ni)	
1 - 3	*5122174000	Connector Socket, 12P (WHT)	
1 - 4	*5122168000	Connector Socket, 6P (WHT)	
1 - 5	*5122164000	Connector Socket, 2P (WHT)	
1 - 6	*5555570000	Cushion, Top Cover; B	
1 - 7	*5800112701	Escutcheon Assy, Cassete	
1 - 8	*5800118001	Escutcheon, Counter	
1 - 9	*5800111201	Escutcheon Assy, Meter [All except US]	
	*5800145901	Escutcheon Assy, Meter [US]	
1 - 10	5800118100	Knob, VR; A	
1 - 11	5800113501	Button, B	
1 - 12	5800113701	Button, D	
1 - 13	5800113601	Button, C	
1 - 14	5800113402	Button, A	
1 - 15	*5800113901	Shaft, Button	
1 - 16	*5800114001	Plate, GND; A	
1 - 17	*5800113800	Escutcheon, Control	
1 - 18	*5640012700	Panel Assy, Front [All except US]	
	*5640012710	Panel Assy, Front [US]	
1 - 19	*5800122500	Cover, Cassette; (2)	Part of 1-27
1 - 20	*5800123200	Cover, Cassette; (1)	Part of 1-27
1 - 21	*5800116800	Bushing	Part of 1-27
1 - 22	*5800112301	Cover, Bottom	
1 - 23	*5800116100	Foot	
1 - 24	*5800125901	Plate, Shield; B	
1 - 25	*5800142300	Cover, Jack	
1 - 26	*5800148500	Spacer	
1 - 27	5640012800	Cover Assy, Cassette	

INCLUDED ACCESSORIES

REF. NO.	PARTS NO.	DESCRIPTION	REMARKS
	5700011100	V-9 Owner's manual [J]	
	5700011200	V-9 Owner's manual [US]	
	5700011300	V-9 Owner's manual [All except J, US]	
	5101369000	Information Supplement [J]	
	5101345000	Information Supplement [US]	
	5101495000	Information Supplement [All except J, US]	

[US] : U.S.A.
: AUSTRALIA
[J] : JAPAN
[C] : CANADA
[E] : EUROPE
[GE] : GENERAL EXPORT
[UK] : U.K.

EXPLODED VIEW - 2

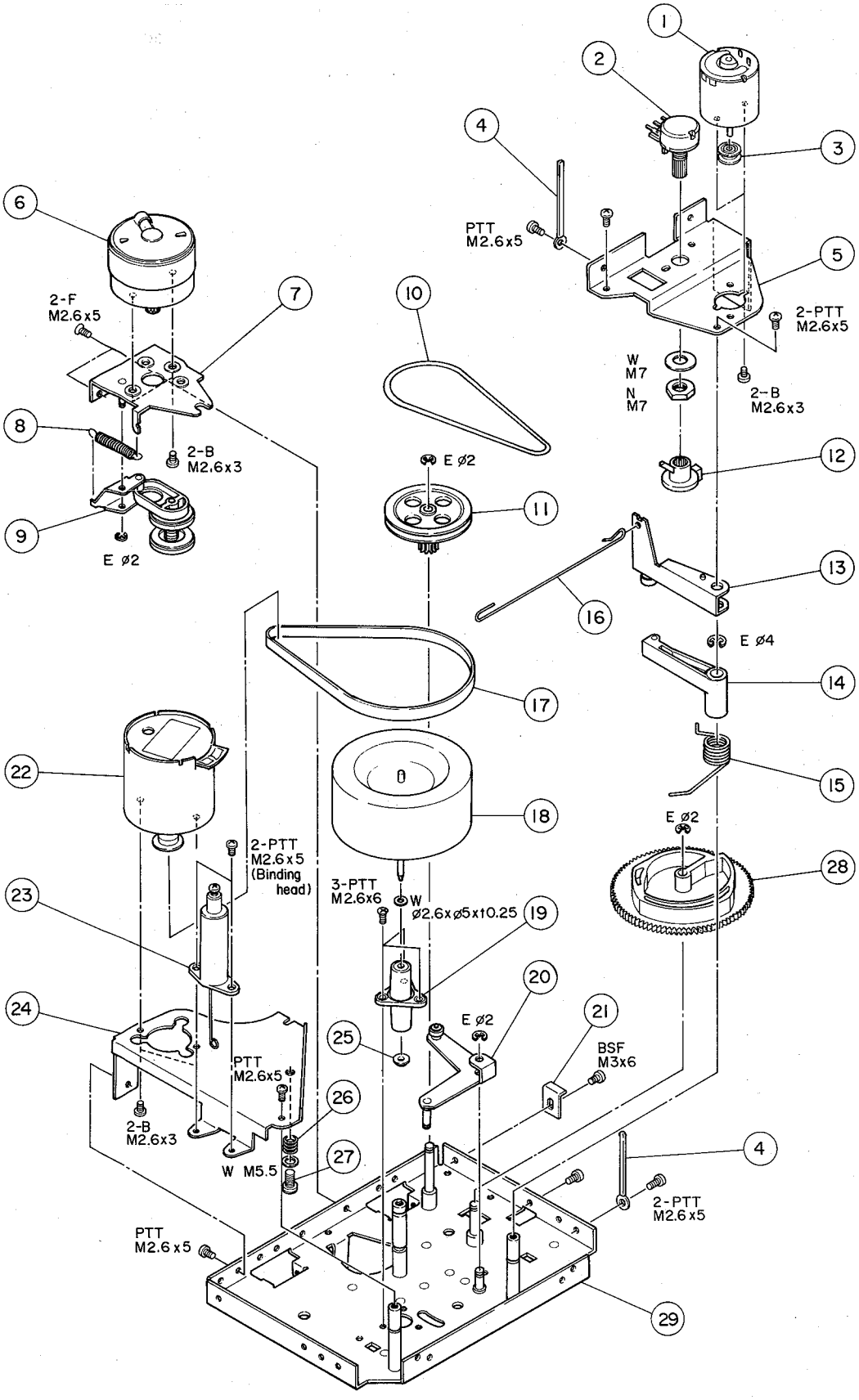


Parts marked with *require longer delivery time.

REF. NO.	PARTS NO.	DESCRIPTION	REMARKS
2 - 1	*5800131902	Holder Sub-assy, Cassette	
2 - 2	*5581056000	Screw, Shoulder; A	Part of 2-1 A-304
2 - 3	*5800120100	Roller, Guide	Part of 2-1
2 - 4	*5800115400	Spring, Cassette Pressure	
2 - 5	*5800109600	Holder, L	
2 - 6	*5800115500	Spring, Holder; L	
2 - 7	*5800121300	Bracket Assy, Holder; L	
2 - 8	*5800119100	Arm, Eject	
2 - 9	*5800115700	Spring, Lock	
2 - 10	*5800117500	Seal, Cassette	Part of 2-1
2 - 11	*5800122100	Holder, R	
2 - 12	*5800119000	Bracket, Holder Guide	
2 - 13	*5800115600	Spring, Holder; R	
2 - 14	*5800121400	Bracket Assy, Holder; R	
2 - 15	*5800122901	Holder Sub-assy, Cassette; (1)	Part of 2-1
2 - 16	*5800122400	Holder, Cassette; (2)	Part of 2-1
2 - 17	5378900300	Head, Erase	
2 - 18	5378600200	Head, REC/PLAY	
2 - 19	*5800114700	Spring, Head	
2 - 20	*5800122600	Stand, Head	
2 - 21	*5800114900	Spring, Base Plat Pressure	
2 - 22	5540055000	Steel Ball, ϕ2	A-450
2 - 23	*5800117301	Arm, Sensor	
2 - 24	*5800119300	Plate, Head Base	
2 - 25	5540056000	Steel Ball, ϕ3	A-450
2 - 26	*5800114100	Spring, Head Base	
2 - 27	*5800122800	Plate, Slider	
2 - 28	5800120400	Arm Assy, Pinch Roller	
2 - 29	*5800131601	Arm Assy, Brake; L	
2 - 30	*5800131701	Arm Assy, Brake; R	
2 - 31	*5800114800	Spring, Brake	
2 - 32	5800107300	Table Assy, Reel; Supply	
2 - 33	5800106700	Belt, Counter	
2 - 34	5800108701	Table Assy, Reel, Take-up	
2 - 35	*5800115002	Spring, Cassette Pressure	
2 - 36	5301455300	Switch, Micro	
2 - 37	*5800115300	Spring, Pinch Roller Arm	
2 - 38	*5554447000	Plate, Micro Switch	A-400
2 - 39	*5800117400	Guide, Cassette	
2 - 40	*5800119200	Plate, Stopper	
2 - 41	*5800109701	Chassis Assy, Mechanism	
2 - 42	*5800152600	Spring, Arm Return	

[US] : U.S.A. [C] : CANADA [GE] : GENERAL EXPORT
[A] : AUSTRALIA [E] : EUROPE [UK] : U.K.
[J] : JAPAN

EXPLODED VIEW - 3

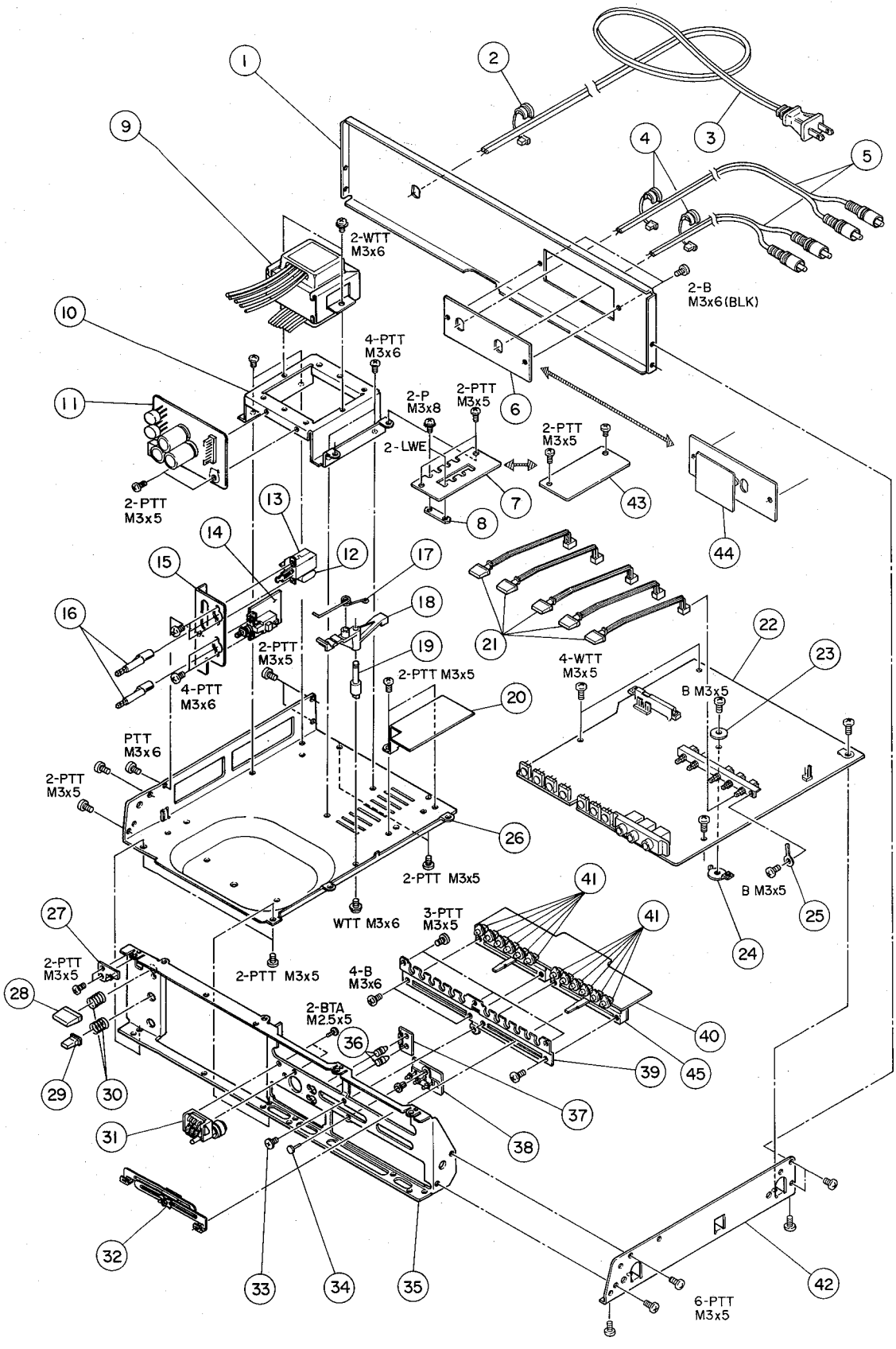


Parts marked with *require longer delivery time.

REF. NO.	PARTS NO.	DESCRIPTION	REMARKS
3 - 1	5370001400	Motor, Control; DC	
3 - 2	5282009601	Var. Res., 10kΩ (B)	
3 - 3	*5800123300	Pulley, V	
3 - 4	*5581038000	Clamper, Cord; A	
3 - 5	*5800122200	Bracket, Motor	
3 - 6	5370001200	Motor Assy, Reel; DC	
3 - 7	*5800121800	Bracket Assy, Reel Motor	
3 - 8	*5800115800	Spring, Idler Arm	
3 - 9	5800107800	Idler Assy	
3 - 10	5800106800	Belt, Reduction Pulley	
3 - 11	*5800117200	Pulley, Reduction	
3 - 12	*5800116700	Joint	
3 - 13	*5800107001	Lever Sub-assy, Record	
3 - 14	*5800105400	Arm Assy, Balance	
3 - 15	*5800114600	Spring, Balance Arm	
3 - 16	*5800114400	Rod, Record	
3 - 17	5800106900	Belt, Capstan Drive	
3 - 18	5800106401	Flywheel Assy, Capstan	
3 - 19	*5800106200	Housing Assy, Capstan	
3 - 20	*5800105801	Arm Assy, Base Plate Actuating	
3 - 21	*5800148600	Stopper	
3 - 22	5370001100	Motor Assy, Capstan; DC	
3 - 23	*5800131802	Damper Assy	
3 - 24	*5800122301	Bracket, Flywheel	
3 - 25	*5534130000	Retainer, Oil	
3 - 26	*5800161400	Spring, Thrust	
3 - 27	*5800156300	Screw, Thrust	
3 - 28	*5800122700	Cam, Control	
3 - 29	*5800109701	Chassis Assy, Mechanism	

[US]: U.S.A. [C]: CANADA [GE]: GENERAL EXPORT
[A] : AUSTRALIA [E]: EUROPE [UK]: U.K.
[J] : JAPAN

EXPLODED VIEW - 4



Parts marked with *require longer delivery time.

REF. NO.	PARTS NO.	DESCRIPTION	REMARKS
4 - 1	*5800112502	Panel Rear	
4 - 2	*5534660000	Strain Relief, AC Power Cord [All except UK]	
	*5534661000	Strain Relief, AC Power Cord [UK]	
4 - 3	⚠*5128034000	Cord, AC Power [J]	
	⚠*5128075000	Cord, AC Power [US, C, GE]	
	⚠*5128047000	Cord, AC Power [UK]	
	⚠*5350008200	Cord, AC Power [E]	
	⚠*5350008300	Cord, AC Power [A]	
4 - 4	*5534660000	Strain Relief, Cord	
4 - 5	*5350008600	Cord, In-output [All except US]	
	*5350008700	Cord, In-output [US]	
4 - 6	*5800117801	Plate, In-output; A [All except E]	
	*5800117901	Plate, In-output; B [E]	
4 - 7	*5200034900	PCB Assy, VOLTAGE SELECTOR [GE]	
4 - 8	*5555062000	Bar, Jumper; A [GE]	
4 - 9	⚠ 5320005800	Transformer, Power [J]	
	⚠ 5320005900	Transformer, Power [US]	
	⚠ 5320006000	Transformer, Power [C]	
	⚠ 5320006100	Transformer, Power [GE]	
	⚠ 5320006201	Transformer, Power [E, UK, A]	
4 - 10	*5800118600	Bracket, Transformer	
4 - 11	*5200029701	PCB Assy, MECHANISM	
4 - 12	⚠ 5052905000	Spark Killer, 0.1μF + 120Ω/300V [J]	
	⚠ 5052906000	Spark Killer, 0.33μF + 120Ω/250V [US]	
	⚠ 5052911000	Spark Killer, 0.033μF + 120Ω/250V [C]	
	⚠ 5292002500	Spark Killer, 0.01μF/300Ω [GE]	
	⚠ 5267702500	Spark Killer, 0.047μF/250V [E, UK, A]	
4 - 13	⚠ 5134018000	Switch, Power [US, C]	
	⚠ 5134120000	Switch, Power [J]	
	⚠ 5134044000	Switch, Power [E, UK, A]	
	⚠ 5134009000	Switch, Power [GE]	
4 - 14	*5200029800	PCB Assy, TIMER	
4 - 15	*5800118400	Bracket, Switch	
4 - 16	*5800116200	Rod, A	
4 - 17	*5800115200	Spring, Record	
4 - 18	*5800116600	Arm Record	
4 - 19	*5800112100	Shaft, Record Arm	
4 - 20	*5800125801	Plate, Shield; A	
4 - 21	5800119801	Knob, A	
4 - 22	*5200029405	PCB Assy, REC/PLAY [All except US]	
	*5200029415	PCB Assy, REC/PLAY [US]	
4 - 23	*5580007000	Washer, ϕ3.2 x ϕ17.8 x t0.8	
4 - 24	*5800009000	Bracket, PCB	
4 - 25	*5786700300	Lug, GND	
4 - 26	*5800112201	Chassis, Left	
4 - 27	*5200030300	PCB Assy, LED (B)	
4 - 28	5800119700	Button, P	
4 - 29	5800119600	Button, T	
4 - 30	*5800130200	Spring, GND; B	
4 - 31	*5800119900	Counter, Tape	
4 - 32	*5800145502	Slider Assy	
4 - 33	*5581055000	Screw, Shoulder; D	
4 - 34	*5534118000	Push Rivet	A-400
4 - 35	*5800112401	Chassis, Front	
4 - 36	*5534448000	Cushion, Rubber	A-103
4 - 37	*5200029900	PCB Assy, REED SWITCH	
4 - 38	*5200030200	PCB Assy, LED (A)	
4 - 39	*5800119402	Bracket, VR	
4 - 40	*5200029601	PCB Assy, METER	
4 - 41	5310005300	Lamp, DC14V	
4 - 42	*5800112600	Chassis, Right	
4 - 43	*5200030100	PCB Assy, FUSE [E]	
4 - 44	*5200030000	PCB Assy, DIN [E]	
4 - 45	5284005200	Var. Res., Slide	

[US]: U.S.A. [C]: CANADA [GE]: GENERAL EXPORT
[A] : AUSTRALIA [E]: EUROPE [UK]: U.K.
[J] : JAPAN

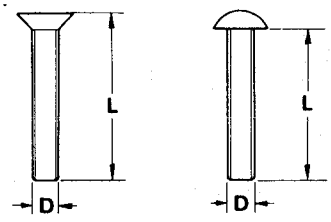
ASSEMBLING HARDWARE CODING LIST

All screws conform to ISO standards, and have crossrecessed heads, unless otherwise noted.
ISO screws have the head inscribed with a point as in the figure to the right.

FOR EXAMPLE:

B M 3 x 6

- B — Nomenclature
- M — Metric System
- 3 — Diameter in mm (D) *
- 6 — Length in mm (L)



* Inner dia. for washers and nuts

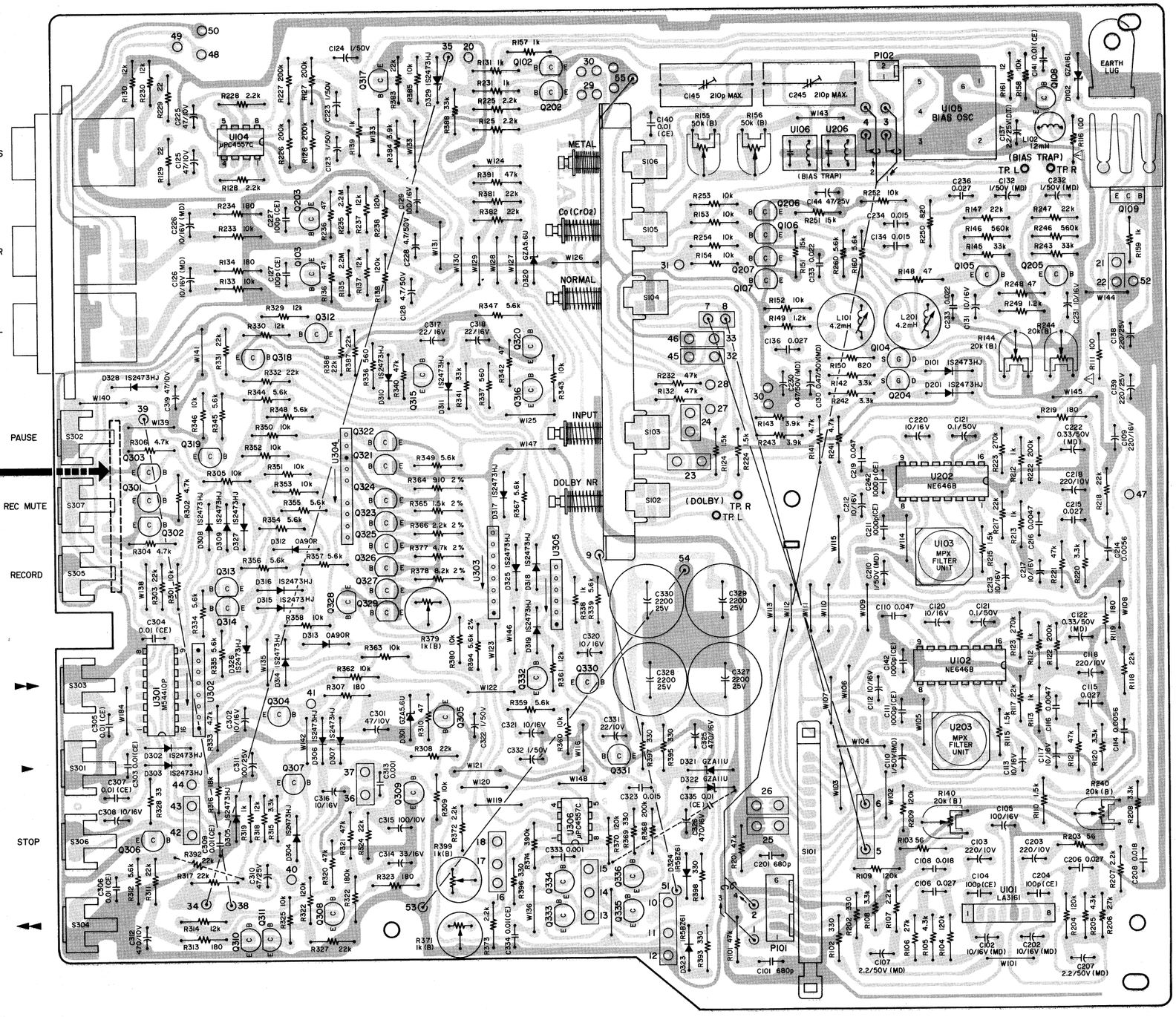
	Code	Name	Type
MACHINE SCREW	R	Round Head Screw	
	P	Pan Head Screw	
	T	Stove Head Screw (Truss)	
	B	Binding Head Screw	
	F	Flat Countersunk Head Screw	
	O	Oval Countersunk Head Screw	
WOOD SCREW	RW	Round Head Wood Screw	
TAPTITE SCREW	PTT	Pan Head Taptite Screw	
	WTT	Washer Head Taptite Screw	
SEMS SCREW	BSA	Binding Head SEMS Screw(A Type)	
	BSB	Binding Head SEMS Screw(B Type)	
	BSF	Binding Head SEMS Screw(F Type)	
	PSA	Pan Head SEMS Screw(A Type)	
	PSB	Pan Head SEMS Screw(B Type)	

	Code	Name	Type
TAPPING SCREW	BTA	Binding Head Tapping Screw(A Type)	
	BTB	Binding Head Tapping Screw(B Type)	
	RTA	Round Head Tapping Screw(A Type)	
	RTB	Round Head Tapping Screw(B Type)	
SETSCREW	SF	Hex Socket Setscrew(Flat Point)	
	SC	Hex Socket Setscrew(Cup Point)	
	SS	Slotted Socket Setscrew(Flat Point)	
WASHER	E	E-Ring (Retaining Washer)	
	W	Flat Washer (Plain)	
	SW	Lock Washer (Spring)	
	LWI	Lock Washer (Internal Teeth)	
	LWE	Lock Washer (External Teeth)	
	TW	Trim Washer (Countersunk)	
NUT	N	Hex Nut	

7 PC BOARDS AND PARTS LIST

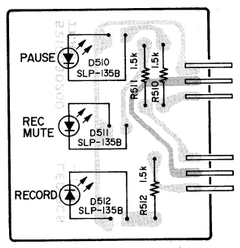
PC Boards shown viewed from foil side except LED PCB A ASSY

REC/PLAY AMP PCB ASSY

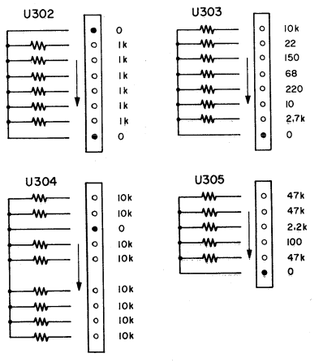


LED PCB A ASSY

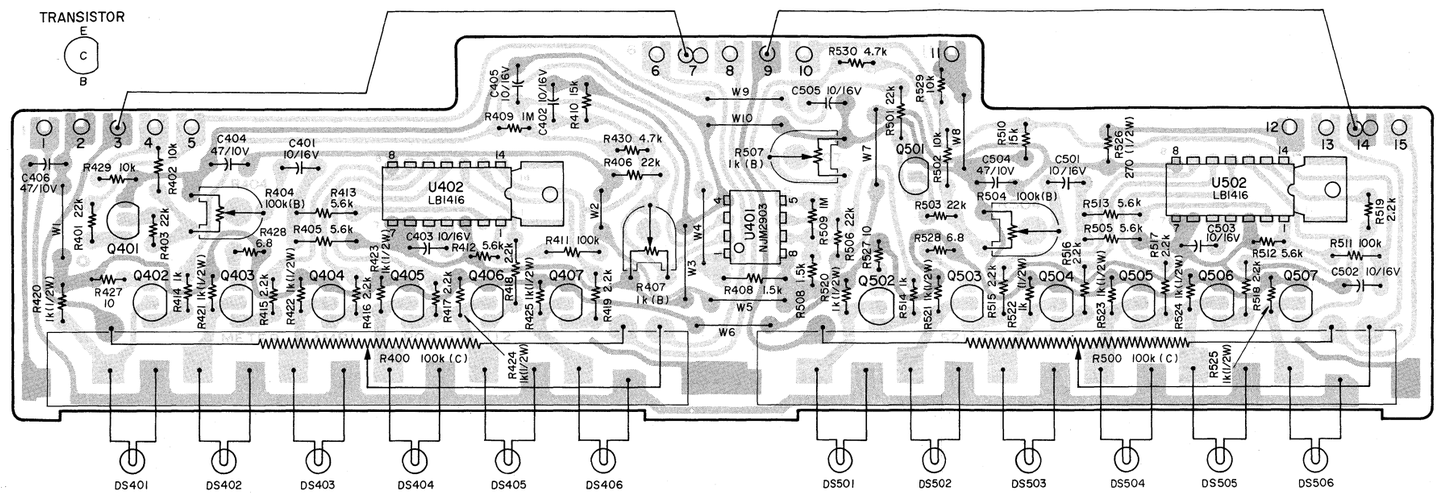
(VIEWED FROM PARTS SIDE)



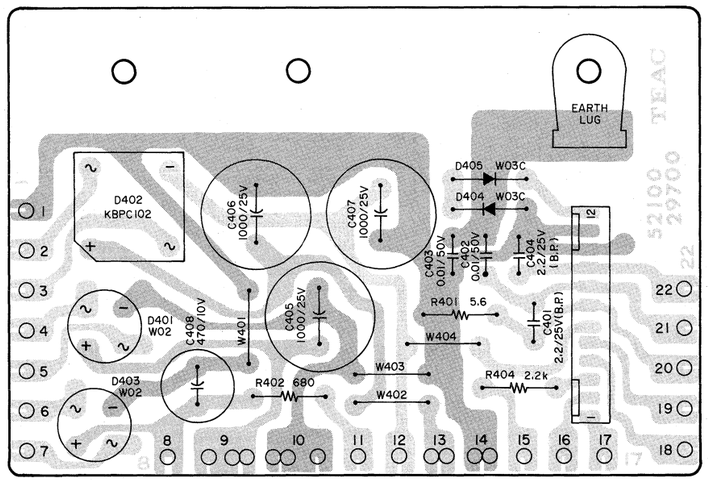
RESISTOR ARRAY



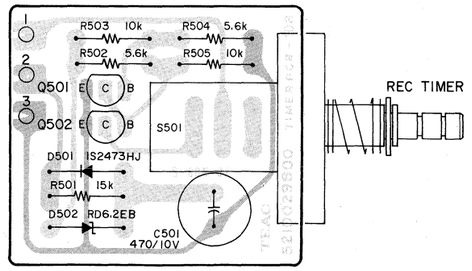
METER PCB ASSY



MECHANISM PCB ASSY



TIMER SW PCB ASSY



NOTES

1. The colors used on the PCB illustrations have the following significance:
   - : +B power supply circuit
   - : −B power supply circuit
   - : GND
   - : Other
2. Resistor values are in ohms (k=1,000 ohms, M=1,000,000 ohms).
3. Capacitor values are in microfarads (p=picofarads).
   - (MD) : Electrolytic capacitor MD series
   - (CE) : Ceramic
   - (SC) : Polystyrene
   - (DT) : Dipped Tantalum
   - (BP) : Bipolar

   All non-polarized capacitors are ±5% Mylar unless otherwise noted.
4. ⚠ Parts marked with this sign are safety critical components. They must always be replaced with identical components - refer to the appropriate parts list and ensure exact replacement.

REC/PLAY AMP PCB ASSY

REF. NO.	PARTS NO.	DESCRIPTION
	5200029405	PCB Assy [All except US]
	5200029415	PCB Assy [US]
	5210029400	PCB [All except US]
	5210029410	PCB [US]
	IC's	
U101	5147062000	LA3161
U102, U202	5147046000	NE646B
U104	5220405000	μPC4557C
U301	5147047000	M54410P
U306	5220405000	μPC4557C
	TRANSISTORS	
Q102, Q202	5145185000	2SD655E
Q103, Q203	5042495000	2SC1222E
Q104, Q204	5145102000	FET 2SK68AL
Q105, Q205	5145092000	2SC1740LNS
Q106, Q206	5145092000	2SC1740LNS
Q107, Q207	5145092000	2SC1740LNS
Q108	5145099000	2SC1741R
Q109	5145087000	2SD313E
Q301~Q303	5145151000	2SC1815GR
Q304	5230773800	2SC2655Y
Q305, Q306	5145151000	2SC1815GR
Q307	5042553000	2SA733P
Q308~Q311	5145151000	2SC1815GR
Q312	5042553000	2SA733P
Q313~Q332	5145151000	2SC1815GR
Q333	5230773800	2SC2655Y
Q334	5230014000	2SA1020Y
Q335	5230773800	2SC2655Y
Q336	5230014000	2SA1020Y
	DIODES	
D101, D201	5143118000	1S2473HJ
D102	5224521700	Zener, GZA16L
D301	5224519600	Zener, GZA5.6U
D302~D311	5143118000	1S2473HJ
D312, D313	5224012800	0A90R
D314~D319	5143118000	1S2473HJ
D320	5224519600	Zener, GZA5.6U
D321, D322	5224521000	Zener, GZA11U
D323, D324	5224014000	1R5BZ61
D325~D329	5143118000	1S2473HJ
	CARBON RESISTORS	
	All resistors are rated ±5% tolerance and ¼ watt unless otherwise noted.	
R101, R201	5183122000	47kΩ
R102, R202	5183070000	330Ω
R103, R203	5183052000	56Ω
R104, R204	5183132000	120kΩ
R105, R205	5183097000	4.3kΩ
R106, R206	5183116000	27kΩ
R107, R207	5183090000	2.2kΩ
R108, R208	5183094000	3.3kΩ
R109, R209	5183132000	120kΩ
R110	5183086000	1.5kΩ
R111	⚠5184249000	100Ω Nonflammable
R112, R212	5183082000	1kΩ
R113, R213	5183082000	1kΩ
R115, R215	5183086000	1.5kΩ
R116	⚠5184249000	100Ω Nonflammable

REF. NO.	PARTS NO.	DESCRIPTION
R117, R217	5183114000	22kΩ
R118, R218	5183114000	22kΩ
R119, R219	5183064000	180Ω
R120, R220	5183094000	3.3kΩ
R121, R221	5183122000	47kΩ
R122, R222	5183137000	200kΩ
R123, R223	5183140000	270kΩ
R124, R224	5183086000	1.5kΩ
R125, R225	5183090000	2.2kΩ
R126, R226	5183137000	200kΩ
R127, R227	5183137000	200kΩ
R128, R228	5183090000	2.2kΩ
R129, R229	5183042000	22Ω
R130, R230	5183108000	12kΩ
R131, R231	5183082000	1kΩ
R132, R232	5183122000	47kΩ
R133, R233	5183106000	10kΩ
R134, R234	5183064000	180Ω
R135, R235	5183162000	2.2MΩ
R136, R236	5183050000	47Ω
R137, R237	5183108000	12kΩ
R138, R238	5183132000	120kΩ
R139	5183082000	1kΩ
R141, R241	5183098000	4.7kΩ
R142, R242	5183094000	3.3kΩ
R142, R243	5183096000	3.9kΩ
R145, R245	5183118000	33kΩ
R146, R246	5183148000	560kΩ
R147, R247	5183114000	22kΩ
R148, R248	5183050000	47Ω
R149, R249	5183084000	1.2kΩ
R150, R250	5183080000	820Ω
R151, R251	5183110000	15kΩ
R152, R252	5183106000	10kΩ
R153, R253	5183106000	10kΩ
R154, R254	5183106000	10kΩ
R157	5183082000	1kΩ
R158	5183106000	10kΩ
R159	5183082000	1kΩ
R160, R260	5183100000	5.6kΩ
R161	5183036000	12Ω
R301	5183106000	10kΩ
R302	5183098000	4.7kΩ
R303	5183114000	22kΩ
R304	5183098000	4.7kΩ
R305	5183106000	10kΩ
R306	5183098000	4.7kΩ
R307	5183064000	180Ω
R308	5183114000	22kΩ
R309	5183106000	10kΩ
R310	5183050000	47Ω
R311	5183114000	22kΩ
R312	5183100000	5.6kΩ
R313	5183064000	180Ω
R314	5183108000	12kΩ
R315	5183094000	3.3kΩ
R316	5183112000	18kΩ
R317	5183114000	22kΩ
R318	5183108000	12kΩ
R319	5183082000	1kΩ
R320	5183122000	47kΩ
R321	5183122000	47kΩ
R322	5183132000	120kΩ

[US]: U.S.A. [C]: CANADA [GE]: GENERAL EXPORT
[A]: AUSTRALIA [E]: EUROPE [UK]: U.K.
[J]: JAPAN

REF. NO.	PARTS NO.	DESCRIPTION			
R323	5183064000	180Ω			
R324	5183114000	22kΩ			
R325	5183106000	10kΩ			
R326	5183114000	22kΩ			
R327	5183114000	22kΩ			
R328	5183046000	33Ω			
R329	5183108000	12kΩ			
R330	5183108000	12kΩ			
R331	5183114000	22kΩ			
R332	5183114000	22kΩ			
R333	5183098000	4.7kΩ			
R334	5183100000	5.6kΩ			
R335	5183100000	5.6kΩ			
R336	5183076000	560Ω			
R337	5183076000	560Ω			
R338	5183082000	1kΩ			
R339	5183100000	5.6kΩ			
R340	5183122000	47kΩ			
R341	5183118000	33kΩ			
R342	5183050000	47Ω			
R343	5183106000	10kΩ			
R344, R345	5183100000	5.6kΩ			
R346	5183106000	10kΩ			
R347~R349	5183100000	5.6kΩ			
R350~R353	5183106000	10kΩ			
R354~R357	5183100000	5.6kΩ			
R358	5183106000	10kΩ			
R359, R360	5183100000	5.6kΩ			
R361	5183108000	12kΩ			
R362, R363	5183100000	5.6kΩ			
R364	5185091000	910Ω	2%		
R365	5185096000	1.5kΩ	2%		
R366	5185100000	2.2kΩ	2%		
R367	5183100000	5.6kΩ			
R368	5183137000	200kΩ			
R369	5183070000	330Ω			
R370	5183132000	120kΩ			
R372, R373	5183090000	2.2kΩ			
R374	5183144000	390kΩ			
R377	5185108000	4.7kΩ	2%		
R378	5185114000	8.2kΩ	2%		
R380	5183106000	10kΩ			
R381~R383	5183114000	22kΩ			
R384	5183096000	3.9kΩ			
R385	5183106000	10kΩ			
R386, R387	5183114000	22kΩ			
R388	5183118000	33kΩ			
R391	5183122000	47kΩ			
R392	5183114000	22kΩ			
R393	5183070000	330Ω			
R394	5185110000	5.6kΩ	2%		
R395~R398	5183070000	330Ω			

CAPACITORS

C101, C201	5059827000	Polyst.	680pF	50V	10%
C102, C202	5173571800	Elec.	10μF	16V	
C103, C203	5173053800	Elec.	220μF	10V	
C104, C204	5172312000	Ceramic	100pF	50V	10%
C105	5173045800	Elec.	100μF	16V	
C106, C206	5170435000	Mylar	0.027μF	100V	5%
C107, C207	5173480800	Elec.	2.2μF	50V	
C108, C208	5170431000	Mylar	0.018μF	100V	5%
C109	5173054800	Elec.	220μF	16V	

REF. NO.	PARTS NO.	DESCRIPTION			
C110, C210	5173556800	Elec.	1μF	50V	
C111, C211	5172324000	Ceramic	0.001μF	50V	10%
C112, C212	5173010800	Elec.	10μF	16V	
C113, C213	5173010800	Elec.	10μF	16V	
C114, C214	5170419000	Mylar	0.0056μF	100V	5%
C115, C215	5170435000	Mylar	0.027μF	100V	5%
C116, C216	5170417000	Mylar	0.0047μF	100V	5%
C117, C217	5173010800	Elec.	10μF	16V	
C118, C218	5173053800	Elec.	220μF	10V	
C119, C219	5170441000	Mylar	0.047μF	100V	5%
C120, C220	5173010800	Elec.	10μF	16V	
C121, C221	5173550800	Elec.	0.1μF	50V	
C122, C222	5173553800	Elec.	0.33μF	50V	
C123, C223	5172992800	Elec.	1μF	50V	
C124	5172992800	Elec.	1μF	50V	
C125, C225	5173035800	Elec.	47μF	10V	
C126, C226	5173571800	Elec.	10μF	16V	
C127, C227	5172312000	Ceramic	100pF	50V	10%
C128, C228	5173006800	Elec.	4.7μF	50V	
C129	5173045800	Elec.	100μF	16V	
C130, C230	5173554800	Elec.	0.47	50V	
C131, C231	5173010800	Elec.	10μF	16V	
C132, C232	5173556800	Elec.	1μF	50V	
C133, C233	5170433000	Mylar	0.022μF	100V	5%
C134, C234	5170429000	Mylar	0.015μF	100V	5%
C136, C236	5170435000	Mylar	0.027μF	100V	5%
C137	5171659000	Dip. Tant.	2.2μF	25V	
C138	5173055800	Elec.	220μF	25V	
C139	5173055800	Elec.	220μF	25V	
C140	5172336000	Ceramic	0.01μF	50V	10%
C141	5172336000	Ceramic	0.01μF	50V	10%
C142, C242	5172324000	Ceramic	0.001μF	50V	10%
C144	5173037800	Elec.	47μF	25V	
C301	5173035800	Elec.	47μF	10V	
C302	5173010800	Elec.	10μF	16V	
C303~C307	5172336000	Ceramic	0.01μF	50V	10%
C308	5173010800	Elec.	10μF	16V	
C309	5172336000	Ceramic	0.01μF	50V	10%
C310	5173037800	Elec.	47μF	25V	
C311	5173046800	Elec.	100μF	25V	
C312	5173071800	Elec.	470μF	10V	
C313	5170401000	Mylar	0.001μF	100V	5%
C314	5173027800	Elec.	33μF	16V	
C315	5173044800	Elec.	100μF	10V	
C316	5173010800	Elec.	10μF	16V	
C317, C318	5173018800	Elec.	22μF	16V	
C319	5173035800	Elec.	47μF	10V	
C320, C321	5173010800	Elec.	10μF	16V	
C322	5172992800	Elec.	1μF	50V	
C323	5170429000	Mylar	0.015μF	100V	5%
C325	5173072800	Elec.	470μF	16V	
C326	5173072800	Elec.	470μF	16V	
C327~C330	5172978800	Elec.	2200μF	25V	
C331	5173017800	Elec.	22μF	10V	
C332	5172992800	Elec.	1μF	50V	
C333	5170401000	Mylar	0.001μF	100V	5%
C334, C335	5172336000	Ceramic	0.01μF	50V	5%

VARIABL RESISTORS

R140, R240	5280003602	Semi-fixed	20kΩ(B)
R144, R244	5280003602	Semi-fixed	20kΩ(B)
R155	5280004002	Semi-fixed	50kΩ(B)
R156	5280004002	Semi-fixed	50kΩ(B)

[US]: U.S.A. [C]: CANADA [GE]: GENERAL EXPORT
[A]: AUSTRALIA [E]: EUROPE [UK]: U.K.
[J]: JAPAN

REF. NO.	PARTS NO.	DESCRIPTION
R371	5280025603	Semi-fixed 1kΩ(B)
R379	5280025603	Semi-fixed 1kΩ(B)
R399	5280025603	Semi-fixed 1kΩ(B)
	TRIMMER CAPACITORS	
C145, C245	5267205300	30—210pF
	COILS	
L101, L201	5286000100	Choke 4.2mH (Variable)
L102	5160151000	Choke 1.2mH (fixed)
	MISCELLANEOUS	
U103, U203	5292802500	Filter, Low-pass
U105	5292200700	OSC Unit, 100kHz
U106, U206	5286000200	Coil, Trap; 100kHz
U302	5293000300	Resistor Array
U303	5293000400	Resistor Array
U304	5293000500	Resistor Array
U305	5293000800	Resistor Array
S101	5300907800	Switch, Slide; 6-2
S102~S105	5300020600	Switch, Push; 8-2 (5-gang)
S301~S307	5302100500	Switch, Tact
P101	5122130000	Connector Plug, 6P (WHT)
P102	5122126000	Connector Plug, 2P (WHT)
TP1~TP4	5544750000	Pin (4 used)
	5124063000	Jack, 3-gang
	5555590000	Plate, GND; A
	5553132000	Heatsink

METER PCB ASSY

REF. NO.	PARTS NO.	DESCRIPTION
	5200029601	PCB Assy
	5210029600	PCB
	IC's	
U401	5147059000	NJM2903D
U402, U502	5220405800	LB1416
	TRANSISTORS	
Q401, Q501	5145092000	2SC1740LNS
Q402, Q502	5145099000	2SC1741R
Q403, Q503	5145099000	2SC1741R
Q404, Q504	5145099000	2SC1741R
Q405, Q505	5145099000	2SC1741R
Q406, Q506	5145099000	2SC1741R
Q407, Q507	5145099000	2SC1741R
	CARBON RESISTORS	
	All resistors are rated ±5% tolerance and ¼ watt unless otherwise noted.	
R401, R501	5240171400	22kΩ
R402, R502	5240170600	10kΩ
R403, R503	5240171400	22kΩ
R405, R505	5240170000	5.6kΩ
R406, R506	5240171400	22kΩ
R408, R508	5240168600	1.5kΩ
R409, R509	5240175400	1MΩ

REF. NO	PARTS NO.	DESCRIPTION
R410, R510	5240171000	15kΩ
R411, R511	5240173000	100kΩ
R412, R512	5240170000	5.6kΩ
R413, R513	5240170000	5.6kΩ
R414, R514	5240168200	1kΩ
R415, R515	5240169000	2.2kΩ
R416, R516	5240169000	2.2kΩ
R417, R517	5240169000	2.2kΩ
R418, R518	5240169000	2.2kΩ
R419, R519	5240169000	2.2kΩ
R420, R520	5180082000	1kΩ ½W
R421, R521	5180082000	1kΩ ½W
R422, R522	5180082000	1kΩ ½W
R423, R523	5180082000	1kΩ ½W
R424, R524	5180082000	1kΩ ½W
R425, R525	5180082000	1kΩ ½W
R526	5180068000	270Ω ½W
R427, R527	5240163400	10Ω
R428, R528	5240163000	6.8Ω
R429, R529	5240170600	10kΩ
R430, R530	5240169800	4.7kΩ
	CAPACITORS	
C401, C501	5173010800	Elec. 10μF 16V
C402, C502	5173010800	Elec. 10μF 16V
C403, C503	5173010800	Elec. 10μF 16V
C404, C504	5173035800	Elec. 47μF 10V
C405, C505	5173010800	Elec. 10μF 16V
C406	5173035800	Elec. 47μF 10V
	MISCELLANEOUS	
R400, R500	5284005200	Var. Res., 100kΩ(C)
R404, R504	5280004202	Var. Res., Semi-fixed; 100kΩ(B)
R407, R507	5280002802	Var. Res., Semi-fixed; 1kΩ(B)

MECHANISM PCB ASSY

REF. NO.	PARTS NO.	DESCRIPTION
	5200029701	PCB Assy
	5210029700	PCB
	DIODES	
D401	5228005000	W02
D402	5228005100	KBPC102
D403	5228005000	W02
D404, D405	5143315000	W03C
	CARBON RESISTORS	
R401	5183028000	5.6Ω ¼W 5%
R402	5183078000	680Ω ¼W 5%
R404	5183090000	2.2kΩ ¼W 5%
	CAPACITORS	
C401	5171472000	Elec. 2.2μF 25V (B.P.)
C402, C403	5172336000	Ceramic 0.01μF 50V 10%
C404	5171472000	Elec. 2.2μF 25V (B.P.)
C405	5173082800	Elec. 1000μF 25V
C406, C407	5173082800	Elec. 1000μF 25V
C408	5173071800	Elec. 470μF 10V

[US]: U.S.A. [C]: CANADA [GE]: GENERAL EXPORT
[A]: AUSTRALIA [E]: EUROPE [UK]: U.K.
[J]: JAPAN

REF. NO.	PARTS NO.	DESCRIPTION
	MESCELLANEOUS	
	5122136000	Connector Plug, 12P (WHT)
	5555590000	Plate, GND; A

TIMER SW PCB ASSY

REF. NO.	PARTS NO.	DESCRIPTION	
	5200029800	PCB Assy	
	5210029800	PCB	
	TRANSISTORS		
Q501, Q502	5145092000	2SC1740LNS	
	DIODES		
D501	5143118000	1S2473HJ	
D502	5224519700	Zener, GZA6.2L	
	CARBON RESISTORS		
R501	5183110000	15kΩ ¼W	5%
R502	5183100000	5.6kΩ ¼W	5%
R503	5183106000	10kΩ ¼W	5%
R504	5183100000	5.6kΩ ¼W	5%
R505	5183106000	10kΩ ¼W	5%
	MISCELLANEOUS		
C501	5173071800	Capacitor, Elec. 470μF	10V
C501	5134092000	Switch, Push 2-2	

LED PCB A ASSY

REF. NO	PARTS NO.	DESCRIPTION	
	5200030200	PCB Assy	
	5210030200	PCB	
R510~R512	5183086000	Carbon Res. 1.5kΩ ¼W	5%
	5122403000	Pin, Connector	
D510~D512	5225005400	LED, SLP-135B (Red)	
	5800115900	Spacer, LED; A	

LED PCB B ASSY (PC Board Omitted)

REF. NO.	PARTS NO.	DESCRIPTION
	5200030300	PCB Assy
	5210030300	PCB
	5225005400	LED, SLP-135B (Red)
	5800116000	Spacer, LED; B

REED SW PCB ASSY (PC Board Omitted)

REF. NO.	PARTS NO.	DESCRIPTION
	5200029900	PCB Assy
	5210029900	PCB
	5138006000	Switch, Reed
	5534448000	Cushion, Rubber

DIN PCB ASSY [E] (PC Board Omitted)

REF. NO	PARTS NO.	DESCRIPTION
	5200030000	PCB Assy
	5210030000	PCB
	5334010400	Socket, DIN; 5P

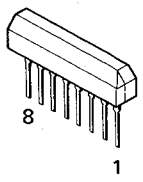
FUSE PCB ASSY [E] (PC Board Omitted)

REF. NO	PARTS NO.	DESCRIPTION
	5200030100	PCB Assy
	5210030100	PCB
F501	⚠5041138000	Fuse, T500mA 250V
F502, F503	⚠5142189000	Fuse, T2A 250V
F504	⚠5041138000	Fuse, T500mA 250V
	5142087000	Holder, Fuse (8 used)

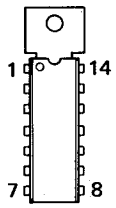
[US]: U.S.A. [C]: CANADA [GE]: GENERAL EXPORT
[A]: AUSTRALIA [E]: EUROPE [UK]: U.K.
[J]: JAPAN

SEMICONDUCTOR ELECTRODES

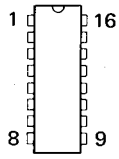
LA3161



LB1416
(TOP VIEW)



M54410P
(TOP VIEW)



NE646B
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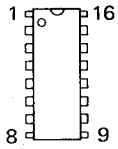

NJM2903D
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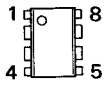

μPC4557C
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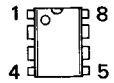
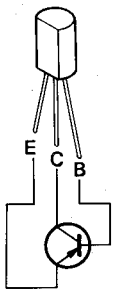


2SA1020Y



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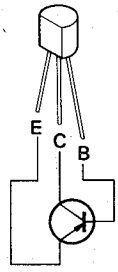

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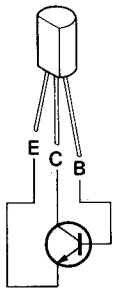

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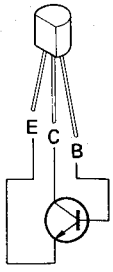
2SC1740LNS
2SC1741R
2SC1815GR
2SD655E



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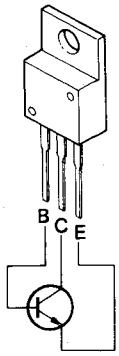

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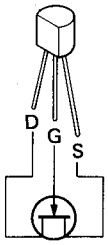

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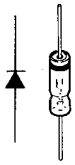

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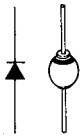

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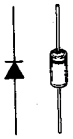
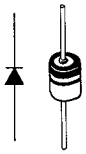
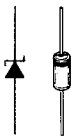


W03C



GZA5.6U
GZA6.2L
GZA11U
GZA16L



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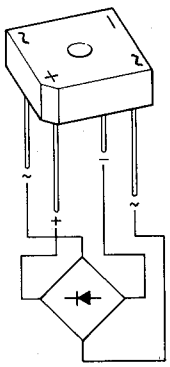
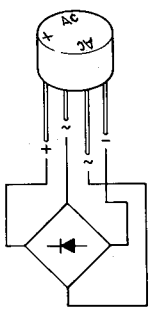


W02



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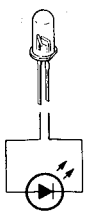

V-9

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PRINTED IN JAPAN 0881 SYU 0.3